DOCUMENT RESUME

ED 442 614 RC 022 523

AUTHOR	Gibbons, Sandra L., Ed.; Liedtke, Werner W., Ed.
TITLE	Connections '99. Proceedings of a Faculty Conference (5th, Victoria, British Columbia, Canada, May 1999).
INSTITUTION	Victoria Univ. (British Columbia).
ISBN	ISBN-1-55058-196-1
PUB DATE	1999-05-00
NOTE	103p.; For selected individual papers, see RC 022 524-525.
AVAILABLE FROM	University of Victoria, Faculty of Education, P.O. Box 3010 STN CSC, Victoria, British Columbia, V8W 3N4 Canada. Full text at Web site: http://www.educ.uvic.ca/connections.
PUB TYPE	Collected Works - Proceedings (021)
EDRS PRICE	MF01/PC05 Plus Postage.
DESCRIPTORS	Educational Research; Elementary Secondary Education; Foreign Countries; Higher Education; *Preservice Teacher Education
IDENTIFIERS	British Columbia

ABSTRACT

This proceedings contains 13 papers from the 1999 annual conference of the Faculty of Education, University of Victoria (British Columbia). The papers are: (1) "Sacred and the Profane in Advertising Art" (Bill Zuk, Robert Dalton); (2) "Finding the Fund$ in Fun Run: Evaluating the Effectiveness and Efficiency of Physical Activity Events as Fund-Raising Tools in the Not-for-Profit Sector" (Joan Wharf Higgins, Lara Lauzon); (3) "'GirlPower': Assessing the Health Impacts of a Community-Based Recreation Program for Inner-City Female Adolescents" (Joan Wharf Higgins, Nancy Reed, Nancy Sylvain); (4) "Communicating Mathematically: Writing" (Werner W. Liedtke); (5) "Using the Repertory Grid in Teacher Education: Reflective Thought Objects, Story and Metaphor" (Tim Hopper); (6) "Counselling Children of Divorce" (Geoffrey Hett, Jenny Spring, Zane Shannon); (7) "Topical Structure Development in Academic English" (Hitomi Harama, Robert Anthony); (8) "A Resource-Based Learning and Teaching Inservice Program for Elementary Teachers: Victoria '98" (Donald Hamilton); (9) "Team Building through Physical Challenges" (Sandra L. Gibbons); (10) "Studying Intramuscular Metabolism in Children: Technology and Ethics" (Catherine A. Gaul); (11) "The Effect of Instruction on Children's Knowledge of Marine Ecology, Attitudes towards the Ocean and Stances toward Marine Resource Issues" (Shirley Cummins, Gloria Snively); (12) "Recent Canadian Contributions to Adult Literacy Policy and Practice in Tanzania" (Adrian Blunt); and (13) "Teacher Knowledge and the Evaluation of Student Achievement" (John Anderson, Faye Stefan, Lucinda [Cindy] Brown). (Contains references in most papers.) (SV)

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Connections '99

Edited by
Sandra L. Gibbons
Werner W. Liedtke

Faculty of Education
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ISBN 1-55058-196-1

Canadian Cataloguing in Publication Data
Main entry under title: Connections *'99*
Printed in Canada

Website at: http://www.edu.uvic.ca/connections

Design and Production: Jaqui Thompson & Co., Victoria, BC

Order from:
University of Victoria
Faculty of Education
PO Box 3010 Stn. CSC
Victoria, BC V8W 3N4

About the Cover:

This year's cover design is influenced by aspects of nature and spirituality with ocean, sky, and cosmic light radiating in a celebratory closure of the millennium.

Acknowledgments

- Thank you to those who provided financial assistance:
  - ▷ the office of the Vice-President, Research,
  - ▷ the Dean's office,
  - ▷ the Associate Dean's office, and
  - ▷ the Secondary Council.

- Thank you to those who:
  - ▷ took the time to prepare and deliver presentations,
  - ▷ attended,
  - ▷ took the time to submit papers, and
  - ▷ offered support and provided feedback.

- Thanks are also extended to the following individuals:
  - ▷ Gloria Bennett who prepared all of the forms and the design for the mug,
  - ▷ Gayle Buie and Jeanne Crosson who handled the correspondence and registration, and
  - ▷ Bill Zuk, Bob Dalton and Paul Marcano who designed the cover.

Everyone's contribution was greatly appreciated and it helped make the endeavour a worthwhile experience for us.

Sandra Gibbons
Werner Liedtke

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Connections '99
The Conference and the Publication

Announcements from various conferences and gatherings that come across one's desk indicate that a theme based on *connecting* is quite popular and by no means unique. However, one thing that may be somewhat unique could be the format of the Faculty of Education's *Connections Conference*. The goal of this get-together is not only to learn something about each other's areas of interest and work, but more about each other as well. Presenters are given only a few minutes to share with the audience ideas related to projects that have recently been completed or are in progress. This format allows for exposure to numerous ideas in a relatively short time.

The fifth annual *Connections Conference* was held on May 1999 at Dunsmuir Lodge. The varied background of the different presenters made *connections* beyond the Faculty possible. Those in attendance listened to presentations from representatives of the Department of Arts in Education, the Department of Communication and Social Foundations, the School of Physical Education, the Department of Psychological Foundations in Education, the Department of Social and Natural Sciences (the list of the components of the Faculty of Education is historic since this is the last year for some of these groups), the Ministry of Education, and the Greater Victoria School District. Presentations by graduate students and a visitor to the Faculty rounded out the day's program. The brief sessions provided insight into points of view, methods of inquiry and a body of knowledge that *connects* those who are interested in probing aspects of teaching and learning.

We think that the papers that are included in this volume illustrate the diverse perspectives of those who share common interests in education. The papers not only extend our understanding of different components of education, but also our understanding of each other. We think the papers capture the flavour of the *Connections Conference* and we hope their presentation here can make a contribution to *connecting* us together as a Faculty of Education as we strive to reach our goals.

Sandra L. Gibbons
Werner W. Liedtke

Sacred and the Profane in Advertising Art

Bill Zuk and Robert Dalton

Advertising art is sometimes referred to as the lowest of art forms, yet it seems to have considerable impact on student consumers. This paper examines the arguments for and against inclusion of advertising art in art programs. It presents a case for the educational benefits of investigating and critically examining advertising art based on museum masterpieces.

Introduction

For many art educators there exists an uneasy feeling about the relationship between advertising art and museum masterpieces. Whether we know it or not, all of us have probably seen artwork by famous artists adapted and incorporated into advertising. For example, Munch's *The Scream*, Rodin's *The Thinker*, and Botticelli's *Primavera*. Advertising art sometimes makes use of these fine art masterpieces to gain our attention, to entertain us with clever adaptations of familiar exemplars, to associate its goods and services with the values we attach to museum treasures, and to help us remember a product. Students need to be aware of the fact that the objectives of advertising artists and art educators differ. When students are introduced to fine art exemplars, considerable energy is invested in fostering respect and cultivating an appreciation for the complexity, subtlety, and timeless quality of great art. The possibility that advertising undermines our efforts and trivializes masterpieces is considered.

For art educators, advertising art can become part of the classroom curriculum. The popular arts embodied in magazines, comics, film, and other forms of mass media are seen as a logical starting place to engage students in the serious investigation and critical examination of art. One natural progression consists of moving though advertising "adaptations" to the original artwork that inspired it. A progression from advertising art to museum art can serve to build respect and establish links to historical traditions. Advertising's use of fine art exemplars acknowledges the power of the artwork and opens the door to meaningful discussions about the relationships between economics and art, high art and low art, and numerous issues of aesthetics.

This study began with a search for paired examples featuring "sacred" museum art masterpieces and "profane" alterations used for the purpose of advertising.

The following questions guided the research: Which art masterpieces are commonly used in marketing goods and services? How are advertising ideas merged or joined with master artwork? How can effective strategies related to masterpieces be implemented in teaching?

Museum Exemplars and Advertising Art

There is a distinction to be made between influence and appropriation. Both fine and popular artists create their work in a context of knowledge about historical and contemporary art. The influence of traditions is pervasive, acknowledged by the artists themselves, and can often be detected by others. This study examines work that is appropriated and obviously borrowed and includes only minor changes, such as the introduction or addition of a product and/or a linguistic message. Any search for examples of fine art masterpieces used in advertising art will depend on familiarity with art history and ability to recognize the variations as they are presented in magazines and other popular art forms.

Advertisements are generally created for the public domain, so familiarity and recognition are a key to their effectiveness. As a result, advertising artists typically use a small set of exemplars that are likely to be recognized by non-experts. As little as possible is usually changed to capture the interest of viewers.

The search for primary examples of masterpiece ads was relatively easy. It was found that a larger number of the appropriated images used by advertisers involved masterpieces from the Italian Renaissance. The best known works of two famous artists, Leonardo da Vinci and Michelangelo, have been used repeatedly. Indeed, it would be possible to create an extensive exhibition of examples from popular media that have re-interpreted Leonardo's *Mona Lisa* or Michelangelo's *David*. A considerable number of advertising artworks have also used the French Impressionists and post-Impressionists such as Monet, Van Gogh, and Gauguin. Appropriation has generally followed the shifting centres of Western art, from Western Europe to America where American Regionalism gave a "home-grown" appeal to artists like Grant Wood and Pop Artists like Andy Warhol.

In every case, the borrowed masterpieces are of interest to a general audience and accessible in terms of having recognizable content. For instance, there is nothing more engaging than portraits and representations of the human figure. People are generally more favorably disposed to realism than abstraction. This disposition tends to eliminate subjects like landscape or still life, and art styles or movements like Abstract Expressionism and Surrealism. Although this limits

the field of choice considerably, it still leaves open the question of why some images have a certain power that makes them so compelling. Why has Grant Wood's *American Gothic* and August Rodin's *The Thinker* become so popular, while other impressive figurative works remain "unexploited?" This is an intriguing question and one that can lead to a productive discussion in the classroom.

While it is fairly easy to identify commonly used artworks, it was not possible to discover any limits to the range of advertised products and services that are joined to the exemplars. The exemplars seemed quite diverse and included such things as jewelry, cosmetics, bathroom fixtures, detergent, clothing, food, alcohol, paper plates, and airlines. For the advertising artist who is assigned the task of promoting a product, the decision as to which exemplar to adopt can be a very important one. Some combinations tend to be more advantageous, artistically and commercially, than others. "Mona Lisa" may be recast as a spokesperson holding almost any product in her hands. However, when she is holding a certain brand of pasta, the connections between Italy, tradition, and quality seem a more natural extension of the ideas and values an advertiser would choose to boost sales of the product. Much has been said about the enigmatic smile of Mona Lisa. When the teeth whitening product, Pearl Drops, was placed next to a close-up of the famous portrait, along with the caption *"It'll make you smile,"* the match seemed a natural and even memorable one (see Figure 1). Considering the fact that art conservators use chemicals to remove layers of soot and varnish in order to restore paintings to their original brilliance, the match seems even more appropriate.

Since paper plates are often used for large gatherings and picnics, the artist's decision to include Royal Chinet products in the gathering of elegantly dressed ladies and gentlemen of Monet's famous painting "*Picnic*" seems an excellent choice. It is also possible for a "fit" to be too good. If the newly introduced product fits too well within the masterpiece, there is a chance that viewers may not even discover the addition or intended association. Text can sometimes be used to guide viewers and the Royal Chinet advertisement that appears in one collection carried the jingle —

"The Picnic" by Monet
"The Plates" by Chinet

Not all combinations of product and art are seemingly natural. Advertisers sometimes make their readers stretch their imagination or suspend disbelief in order to combine ideas that are quite distant and even irreverent. Courting controversy can gain attention and make a product memorable. The Kohler Company's ad for a toilet is a case in point. Using Michelangelo's Sistine

Chapel figure of God that shows a hand extended in the act of creating Adam, commercial artist Scott Seifort replaced the divine creation with the bathroom fixture depicted in Figure 2. At risk of offending Christians and art historians, the company saw the chance to elevate their product and make it memorable. The humble porcelain fixture is cast as a magnificent object — perfection itself.

In another example, Canadian Airlines placed an ad to encourage travelers to fly to Venice. This ad used an adaptation of Michelangelo's famous sculpture of David, regarded by many art historians as a symbol of the Renaissance and a work of surpassing beauty. The slogan, *"We bring Canada to the rest of the world"* was placed below the digitally altered photograph seen in Figure 3. Covering the genitals of the monumental marble figure is a maple leaf. Many people use airlines to travel to Europe and the artistic treasures of Italy are an important attraction. For this reason, it seems a natural advertising campaign. However, the decision to use a maple leaf is one that could create controversy. It may offend some Canadians who feel that our national symbol is dishonored by its use as a "fig leaf." Some viewers might be grateful to the company for concealing this portion of the human anatomy lest it be seen by children who are impressionable or may be confused by depictions of nudity in a family magazine. Still others may find a touch of humour in this subtle addition. For the sponsor of the ad, the use of the maple leaf helps viewers make a further connection between the attraction and where the airline can take us. The issues can be rather complex. Advertisers must consider the effect their ads will have on a broad spectrum of the viewing public.

Masterpieces are altered, but are they necessarily diminished by use in advertising art? Some would argue that certain art masterpieces have become so familiar that we no longer pay them the respect and attention they deserve. Familiarity may have dulled our sensitivity to their aesthetic power. However, by changing them in creative ways, we re-invest them with meaning and are drawn into examining and thinking about them in their new form. Others would add that these exemplars are part of our artistic heritage and they belong to us all. As such, we are free to re-interpret, comment about, and revitalize them in creative ways.

Is there a Place for Advertising Art in the Classroom?

By bringing museum masterpieces, in altered form, into the classroom are we teaching students to disrespect their artistic heritage? Do we risk turning great works into jokes? Not all art exemplars borrowed for use in advertising are meant to be humorous, but examples of this type can be used effectively to

capture student interest and motivate learning. For example, there are occasions where the masterpiece itself is a parody. Pop artist Roy Lichtenstein used sentimental romance comics as the inspiration for some of his large, museum canvases. Borrowing a technique from the printing press, he greatly magnified the dots of ink that make the colours in mass produced images. His work provided a fine commentary on the themes and styles of popular art. In what can be considered as a parody of parodies, advertisers for Sunlight dishwashing detergent created a Lichtenstein-esque ad in which a startled woman discovers "spots" on her glass crystal goblets. The soap opera story line is advanced by the speech balloon recording the woman's startled reaction, *"SPOTS! And Dave's boss is coming for dinner! How will I cope?!"* (see Figure 4). The Sunlight ad is a gentle spoof on modern art, and also a spoof on detergent commercials.

Many artists use humour as a means of making a serious point (Zuk & Dalton, 1998). There is a long and distinguished history of humour in its various forms in visual art such as satire and parody. Some of the masterpieces revered today were "irreverent" in their day. Viewers a century may miss the humour that was evident to those first viewers who understood the artistic and social context in which it was created, later. Some scholarly attention has been given to this topic. Roukes (1997) developed a typology of forms of visual humour that in many ways parallels literary forms.

Some will accept that acknowledging the humour intended by the master artist is one thing, but poking fun at masterpieces is another. Laughing with the artist is alright, but laughing at the artist is not. It can be argued that cultivating a respect for masterpieces should not be a primary objective in teaching. There is a role in public education for preserving tradition and sustaining our institutions, but our greater goal should be to teach students to become critical thinkers, to engage in dialogue, to write, and to create and communicate through visual art. This includes popular art as well as museum art, and contemporary art along with historical works. Klein (1999) reminds us that visual humour is a part of the world of children and cultivating this interest can help sustain their interest in artistic inquiry. Humour affords pleasure and this is a powerful motivating factor in engaging students in learning. This is not a release from the "serious" ideas of disciplined inquiry but may, in fact, be the very heart of the issue.

Thus far it has been assumed that students will be familiar with the masterpieces used in advertising art. This is not always so. Some students may be recent immigrants whose artistic heritage has no connection with Western traditions. There may also be students in our classrooms who, for reasons of economic disadvantage or for other reasons, have not encountered the exemplars in

question. This raises an interesting question. If these students meet the adaptation before being introduced to the exemplar, will their experience of it be different? Will, for example, the original *Mona Lisa* appear as a "knock-off" or a pale imitation of the Pearl Drops ad discussed previously? Or will the ad stimulate interest in meeting the "celebrity" who started it all? The authors believe the latter to be the case. The question is one that would require research in order to gain a definitive answer, but this view has support from other scholars. Pariser (1988) addressed a similar issue with respect to children's responses to another popular art form. Pariser admitted that young children can be very rigid in believing that the first version they are exposed to is the right version and all others are poor copies. However, he also asserted that the mark of a successful work is one that the audience feels can speak to our condition.

Educational Applications and Activities for Students

Using advertising art based on museum masterpieces can serve as an important means of bridging the world of students and the world of teachers, of connecting the familiar world of popular art with the less familiar world of high art. For some readers, compelling as this argument may seem, the most persuasive arguments for inviting advertising art into their classrooms comes from the value that can be abstracted from the suggested learning activities. When promising projects are recommended, the educational opportunities become evident. What follows is a diverse list of possible teaching recommendations for exploring and critically examining advertising art:

- Investigate some of the great masterpieces of modern art. Select one example and use your imagination to alter it in an art project by adding a product or service that this work would seem to support. Use humour to dramatize the product or an exaggeration to inflate reality. For younger students a large-scale art poster could be used and students could draw the product of their choice, cut it out, and temporarily affix it to the poster for discussion.
- Begin with a product or service, in much the same way as an advertising agency might, and identify a masterpiece that could be used to promote it. Create drawings of the original that explore various promotion possibilities. For increased effectiveness, suggest adding collaged images from art calendars, magazine pictures, or scanned images from a computer.
- Invite an advertising artist or art director of an ad agency to discuss how effective ads are made. Pose questions about

least and most successful ad campaigns and try to illustrate each extreme.

- Find television commercials that make use of art masterpieces. Sometimes these can be found as storyboards in *Graphis* publications that acknowledge excellence in graphic design and advertising art. Consider how the use of time and motion in a medium like television affects the representation of the masterpiece and the product. Discuss the effectiveness of the same ads found in magazines. Illustrate key ideas of the discussion.
- Study the campaigns of Absolut Vodka (Lewis, 1996) and other companies that have made it a trademark approach to use masterpieces in advertising or examine anti ads in *Ad Busters*, a Vancouver based publication that takes an irreverent approach to advertising. Create an anti ad.
- The Sunlight advertisement in Figure 4 uses the distinctive style of Lichtenstein rather than making minor modifications to a single work. This would distinguish it as an example of influence rather than appropriation. Find other examples of influence. (This may require a familiarity with artists' styles such as Mondrian's divided design areas, Picasso's cubist renditions, and Seurat's pointillist applications).
- As was evident in the Canadian Airlines ad in Figure 3, there are often issues and perspectives that are complex and interwoven. Choose an ad that uses a masterpiece and critically examine it using a process of analysis, interpretation, and judgement. For example, a Marxist perspective might examine the underlying message about wealth, social status, and consumerism; a feminist perspective might interpret it in terms of its depiction of women; a multicultural approach could take a critical look at how the ad is received by members of minority groups. Other ideas may be suggested by the particular artwork chosen. Organize a debate or discussion with differing points of view. Attempt to illustrate different points of view.
- The critical analysis of advertising images involves considering the complex interactions between masterpiece and product and between text and image. Develop ways of judging the quality of advertising images based on the depiction of the product and the linguistic message. Select several ads and form a judge's panel to determine which are most persuasive, memorable, and artistically superior.

In summary, knowledge about art can be acquired through studio activities that turn a fine art masterpiece into an ad, or begin with a product and find a suitable exemplar to support it. Insight can be gained to the unique challenges of advertising art by examining the industry, its strategies and campaigns in print as well as electronic media. Linkage between fine art and advertising art can also be explored through investigating the topics of appropriation and influence. Students should be drawn into critical analysis and judgement at every opportunity. Advertising art has enormous potential as a field of inquiry that can be both rigorous and enjoyable. It is accessible and therefore has relevance.

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Zuk, B. & Dalton, R. (1998). Humour and cultural perspectives. In S. Gibbons and J. Anderson (Eds.) *Connections '98.* Victoria, B.C: Faculty of Education, University of Victoria.

Figure 1. Pearl Drops Ad

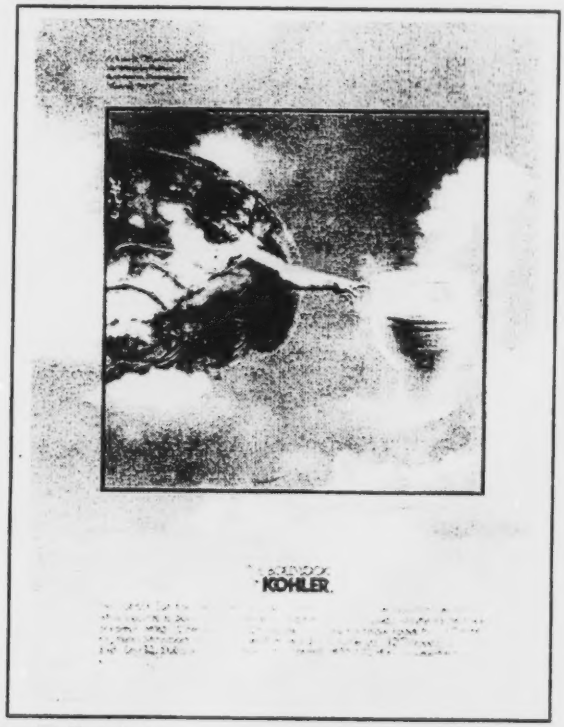

Figure 2. Kohler Toilet Ad

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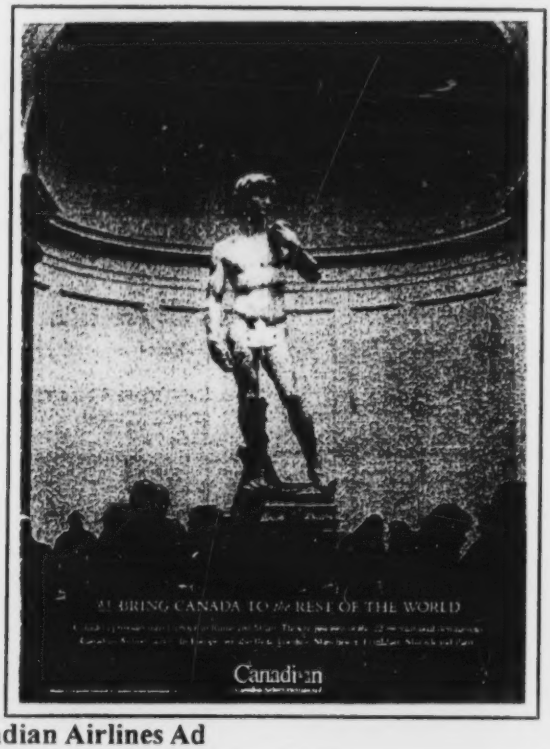

Figure 3. Canadian Airlines Ad

Figure 4. Sunlight Dishwashing Detergent Ad

Finding the Fund$ in Fun Run: Evaluating the Effectiveness and Efficiency of Physical Activity Events as Fund-Raising Tools in the Not-for-Profit Sector

Joan Wharf Higgins and Lara Lauzon[1]

The purpose of this study was to evaluate the effectiveness and efficiency of physical activity as a solicitation strategy and as a public awareness/ public relations tool. A secondary purpose addressed how physical activity events met the recreational, social or entertainment needs of participants who donated their money and energy to a cause. The results indicate that while organizations may be doing the right thing by using physical activity events as fund-raising tools, the issue of efficiency remains vague and increasingly difficult to ensure given the popularity of such event marketing.

Introduction

Most not-for-profit organizations, particularly those in the social change or social service sectors, rely heavily on donated resources to cover both capital needs and operating expenditures. One popular form of raising funds is the special event (Gronbjerg, 1993). Event marketing provides organizations a way to zero in on distinct target markets that other mass marketing alternatives fail to reach (O'Sullivan & Spangler, 1998). An increasingly common variation of the special event involves some type of physical activity.

While it is estimated that special events procure relatively small proportions of total revenues, they are thought to also serve as public relations and awareness tools (Gronbjerg, 1993). It is often in the preparation of events, as well as participation in them, that personal networks are enhanced and a sense of community engendered. Successful events facilitate a celebratory function and promote social cohesion for volunteers, staff and participants. By promoting the organization's mission, new opportunities for funding may also be generated. As well, monies generated from special events are flexible, discretionary sources of revenue over which agencies have full control and provide an independent source of income with no strings attached.

Participation in special events also provides donors with a leisure activity, social interaction and a source of entertainment. Perhaps because this form of giving resembles a traditional market transaction, Gagnard (1989) found special events to be the most popular form of fund-raising. Such an exchange is also attractive for the fund-raiser, who no longer has to rely solely on a specific "cause," like helping children, supporting education, considering health issues, or the environment (Wood Schmader & Jackson, 1997) as an appeal for monies. Offering alternative formats for giving broadens the donor market. Such is the aim of physical activity events, which strive to provide recreational value for the price of registration-as-a-form-of-donation. Some organizations use of physical activity special events in keeping with their mandate or mission while others rely on similar events, which are not directly tied to their overall purpose.

Figures from the United States include estimates, which indicate that about 50 percent of social service agencies rely on income from special events. The actual prevalence and importance of special events to not-for-profit organizations, particularly in Canada, as well as the amount of revenues generated, is not well documented (Gronbjerg, 1993). Lack of information exists about the benefits participants seek from special events and the barriers they wish to avoid, data that seem crucial to any marketing task (Andreason, 1995). Thus, is it important to determine whether participants attend simply for the activity itself, to support the cause, for social reasons or some combination thereof. Such information can enable organizations to better understand their market and then attempt to shape fund-raising events to maximize efficiency. Because special events require intense short-term effort with an uncertain payoff, the determination of the effectiveness of such efforts to attract participants and funds is an important factor (Luksetich & Nold Hughes, 1997). In business terms, special events would not be worthwhile for organizations, nor the attending participants, unless the value of the net yield exceeds the costs of generating it.

The purpose of this study was to evaluate the effectiveness and efficiency of physical activity as a solicitation strategy and as a public awareness/relations tool. A secondary purpose addressed how well physical activity events met the recreational, social or entertainment needs of participants who donated their money, time and energy.

Methodology

The study tracked, through newspapers/posts/public service announcements on radio and television and online sources, the advertised physical activity

events that were scheduled for delivery in the Capital Regional District (CRD) from April to December in 1998. The authors attended twelve physical activity fund-raising events from May to November 1998 in order to experience the different settings, gather descriptive data, and identify prospective interviewees. Fieldnotes documented the approximate number of participants in attendance, descriptions of the pre and post event activities, duration, the number of volunteers and staff involved in delivery, and other salient factors.

Ten participants were interviewed. The interview guide followed a semi-structured format and queried on: motivation for attending the event; financial donation; previous experience donating to charitable causes; benefits received from participating (networking, meeting new people, sense of pride/community, physical benefits); costs incurred to participate (financial, social, physical, psychic); and future intentions regarding participating in similar events.

Staffs from seven different host organizations were interviewed for their perspectives of the financial and public relations value of the event and the relative utility of the event as a component of their overall fund-raising plan. The semi-structured interview guide for the not-for-profit organizations addressed: the total funds raised relative to target; fund raising expenses as a proportion of total funds raised; number of participants; value of average donation; the dollars raised relative to other forms of fund-raising; the staff's perspective of awareness generated from the event; and the overall benefits versus costs, beyond financial, of using the physical activity event as a resource-attraction tool.

Findings

A total of fifty events (see Table 1 for the 12 events attended by the authors[2]) hosted by organizations in the not-for-profit sector occurred during the nine month tracking period, with June (9 events) and September (14 events) being the busiest months. Fun runs were the most popular (23), followed by golf (10), walks (7), triathlons (3), swimming (2), biking (2), sailing (1) and squash (1) and tennis (1) tournaments. These totals excluded spin-off events that were used to raise dollars for larger events.

Data on the funds raised and number of participants were gathered on 24 events, in which a total gross of $1915 304 (range of $750 to $424069) was raised by 31534 participants (range 50 to 6000), representing 10.5% of the donating market in the CRD. The mean donation per person was $60.73. This amount ranged from a high of $100 entry fee for golf to a minimum donation of "whatever you can afford" for the Terry Fox Fun Run.

EVENT	CAUSE	MONTH	FUNDS RAISED	PARTICIPANTS
Big MS Relay	Multiple Sclerosis Society	May	$10,000	120
24 Hour Relay	BC Lion's Society	June	$424,069	1,320
Arbutus 8K Run	Queen Alexandra Hospital for Children	June	$6,000	360
The Move to Cure Arthitis 10K run	BC Arthritis Society	September		100
The Bay Heart & Stroke Walk	Heart & Stroke Foundation	September	$18,000	600
Art Tour by Bicycle	Art Gallery of Greater Victoria	September	$750	50
Childrun 8K	BC Children's Hospital	September		
Scrambler Golf Tournament	Vancouver Island Prostate Cancer Society	September	$25,000	128
AIDS Walk Canada (5K)	AIDS Canada	September	$40,000	1,000
Terry Fox 10K	Canadian Cancer Society	September	$45,000	800
Royal Victoria Marathon	Tibetan Refugees	October		388
CIBC Run for the Cure (8K)	Canadian Cancer Society	October	$325,000	6,000

Table 1. Physical Activity Events Attended in the CRD

Observations: Cause or Event?

The events that were attended ranged from well established to inaugural, with a purpose of attracting either as many participants as possible or limiting the number to 50. The emphasis of the events, and how they were subsequently organized and delivered, also differed along two distinct lines. Some had a focus on the 'cause', others on the physical activity. Events that favoured the cause were characterized by pre and post-event speeches and testimonials, on-site registration, and extra-curricular activities (education booths, music, refreshments, mascots, prize draw) that generated a "celebratory" atmosphere and one not conducive to adhering to a schedule. The skill and fitness abilities

of participants at these events varied greatly. Competition was not emphasized (e.g., no race numbers, no timing/results). Whenever the physical activity was of paramount importance, the events started on time; results, timing and safety were critical; routes were well planned and staffed; and late registration was minimal. At these events, participants appeared to be well prepared for, and comparably more adept at, the planned exercise.

The Participants' Experiences

*I like to **do** something, rather than just donate money*

The participants' primary reasons for attending events also aligned along the two distinct themes. The "core" offering was either *The Cause*: to support the cause itself, at the local level; or The *Event*: to participate in the physical activity event and its social functions. While the *cause* was acknowledged as important in the latter reason, it was identified as secondary to the event itself. Indeed, participants interviewed who cited the event as their primary motivation, recognized that funds raised went to *a good cause* but could not necessarily recall the *cause* itself nor fully understood its purpose (i.e., *what exactly does "for the kids" mean?*).

Regardless of the reason for participating, those interviewed mentioned the tangible products (t-shirts, draw prizes, refreshments), augmented products (opportunity to exercise and socialize in an organized function, as well as the educational component associated with many of the events) and purposive benefits (giving back to the community, sense of community spirit and pride) as rewards for their participation. According to the participants, these types of rewards could not be found in the more traditional forms of charitable solicitation. Moreover, a sense of collective action, highly visible at the events, served as positive reinforcement for participants' decision to attend. In order to receive these benefits participants were willing to exchange their effort and time for attending the event, raise pledges, and pay the financial costs associated with an event.

Those who were interviewed indicated a preference to pay a higher registration fee (in return for a tax receipt), rather than pursue and collect pledges as the fund-raising component. There was also concern expressed about the increasing number events offered and a recommendation that a *charity series of events* occur, similar to the United Way model of fund-raising, to prevent saturating the market. Participants were also looking for information and feedback from the sponsoring organizations about *the return on their investment*.

The Organizations' Perspectives

We're trying to put the fun back in fund-raising.

Organizations cited the raising of funds and awareness as the two major purposes for hosting physical activity events. The success of reaching these goals appears to differ over time. Initially, events tend to serve primarily as an awareness and publicity-generating tool with a net revenue yield of approximately half of the total funds raised. As organizations become more adept at securing sponsors, volunteers, marketing and delivery, costs subside and generating dollars takes on a more important focus. Registration fees and pledges served as the two primary forms of securing donations, with an incentive scheme built into the latter (i.e., participants who solicited pledges were eligible for increasingly valuable awards for the monies pledged). All organizations relied heavily on sponsors for in-kind contributions (i.e., advertising, refreshments, and volunteers) as well as cash contributions to cover operating costs. The organizers of the larger events created categories for sponsors (e.g., bronze, silver, gold) reflecting the amount donated. The organizations that were interviewed relied on other forms of fund-raising. In addition to the physical activity events, strategies included planned giving, direct mail, telethons and raffles. The main reason for these implied that *it may be the end of door-to-door fund-raising as we know it - people are nervous of opening their doors.*

Some organizations used a combination of paid staff, volunteers and/or contractors to plan and deliver the events. Smaller organizations utilized mainly volunteers. In spite of the time devoted to planning and implementing the event, its net yield, and success in attracting participants, each organizational staff member interviewed reported that the benefits of hosting the event outweighed the costs and indicated intent to support future events.

Conclusion

How effective (are they doing the right thing?) and efficient (are they doing things right?) are physical activity events? The data from the literature (O'Sullivan & Spangler, 1998) and this study suggest that organizations are using the right fund-raising tool in the form of physical activities. The perspectives of the participants that were interviewed, and the observations that were made indicate a preference by participants to be part of an experience, as well as the opportunity to be exposed to feelings of local social activism and altruism, in exchange for donating to a charitable cause. These findings, coupled with the public's wariness of telemarketers and door-to-door solicitation, may indicate that "we've just seen the tip of the iceberg" (O'Sullivan & Spangler, 1998, p. 143) of the frequency and scope of physical activity events.

The issue of efficiency remains less certain. For the more established and/or larger events, particularly those organizations with ties to provincial and national affiliates who can secure local and provincial or national sponsorship or who enjoy particular local popularity with a network of volunteers at their disposal, both a considerable dollar amount and a reputation associated with a signature event are reaped. It will become difficult, however, for organizations late to the scene to secure significant sponsorship to help offset costs, a date on the calendar, and the ability to attract participants in an increasingly saturated market (Wood Schmader & Jackson, 1997). (For example, in the 1999 calendar year, there have been at least five new events introduced for May and June alone.) To maintain viability and increase efficiency, organizations will need to refine and customize what is known as "the peripherals" (O'Sullivan & Spangler, 1998) of the events. Peripherals may include "goodies" such as t-shirts, draw prizes, refreshments, music for entertainment and printed information; acknowledgments in the form of publicity and tax receipts; convenience in terms of options for donating money; the physical activity itself (e.g., run, walk, rollerblade, cycle); and the attributes of the locale where the event takes place (e.g., routes, scenery, marshalling, safety).

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"GirlPower": Assessing the Health Impacts of a Community-Based Recreation Program for Inner-City Female Adolescents

Joan Wharf Higgins, Nancy Reed and Nancy Sylvain

As a 10 month participatory action research project, 'GirlPower' has looked at the relationship between engaging in recreation activities and the health of vulnerable adolescent women. Initial project results support the notion that public recreation goes 'beyond benefits' and serves as a legitimate determinant of population health.

Introduction

"GirlPower" has been a participatory action research project looking at the links between the health of young women and participation in recreation activities. Weekly gatherings dealt with aspects of physical, social and developmental recreation. Beyond simple group discussions, sample activities included laser tag, initiative games, making 'rock' videos and bake sales. The project team included University of Victoria researchers, recreation practitioners and up to 18 young women (aged 10 to 15 years) in the Burnside-Gorge area of Victoria. This community is a working class area, home to over 12 000 people of diverse cultures. A large proportion of residents are single parent families. Over the past five years, the community has experienced an incredible development of condominiums, town houses, apartments and duplexes, leading to increasing stress on an already inadequate infrastructure. The need continues to grow for parks, schools, recreation and social supports. Young women from this neighbourhood are seen as vulnerable to a wide range of health inequities. These include low levels of self-esteem, self-efficacy, body image and physical activity. In fact, this neighborhood recently experienced a youth peer-inflicted beating and drowning incident.

The project explored the health issues of young women and ways in which participation in recreation might contribute positively to health outcomes. It spanned the 1998/99 school year, totaling ten months in length.

Significant Elements of Project

The *population health model* suggested by Green (1999) is useful for addressing the elements of this project. This model looks at the views and needs of the professionals, organizations and participants involved in a population health research program. As can be seen in Figure 1, each group plays a role in the delivery and outcomes of population health.

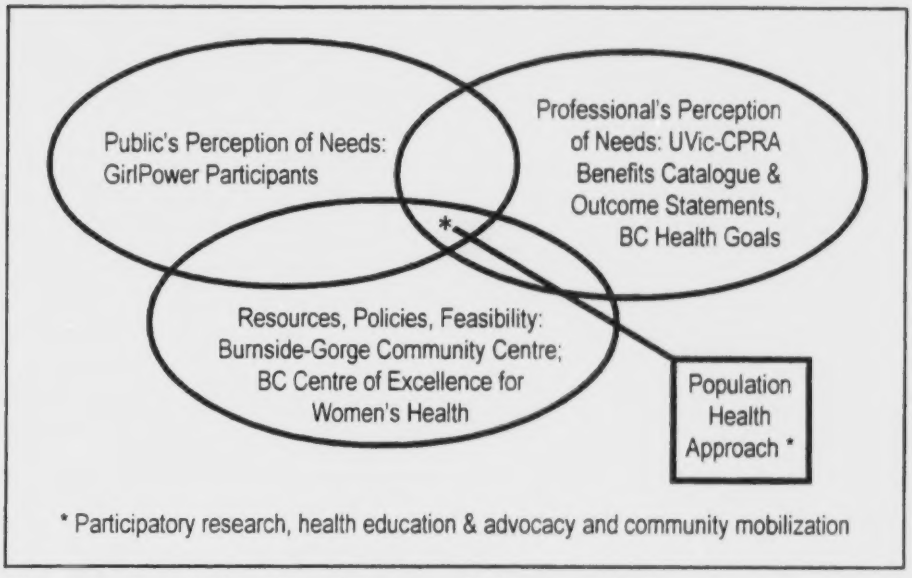
Public's Perception of Needs: GirlPower Participants
Professional's Perception of Needs: UVic-CPRA Benefits Catalogue & Outcome Statements, BC Health Goals
Resources, Policies, Feasibility: Burnside-Gorge Community Centre; BC Centre of Excellence for Women's Health
Population Health Approach *
* Participatory research, health education & advocacy and community mobilization

Figure 1. Population Health Approach (Green, 1999)

Professional's Perceptions of Needs

In outlining the health goals for B.C., the Ministry of Health encourages "sectors to link their policy decisions and investments to health outcomes. The most significant way you can use these health goals is to integrate them into your policy and program planning, resource allocation and monitoring systems" (British Columbia, 1997, p. 9). The document encourages the collaborative action of health-related sectors and the public's participation in such a process. Also released in 1997 was the Canadian Parks and Recreation Association (CPRA) updated report on the benefits of recreation ("The Benefits Catalogue"). An earlier version collated the literature, linking recreation and parks to personal, social, economic and environmental benefits. The 1997 release is intended to help practitioners market leisure, recreation and parks programs and services through the expression of benefits phrased as outcome statements. By doing so, the recreation/parks field is positioning itself as a health promoting

and health determining public service (Herchmer, 1997). However, the catalogue is a compilation of existing research drawn from an interdisciplinary literature and therefore includes data from studies that were not necessarily conducted with the purpose of demonstrating recreation as a determinant of health nor as healthy public policy. Moreover, as the funding of municipal recreation and parks is dependent upon local governments for survival, the field of recreation struggles to prove itself with shrinking public purses and short political attention spans. What scope of and which types of services should be the mandate of public recreation and be worthy of tax support is part of the existing and growing controversy. It is apparent that programs and services increasingly need to be justified by the quality of the experience and the measurable benefits, not by the number of participants who register, nor the amount of money they spend to do so (Dustin, McAvoy & Goodale, 1999; Toalson & Mobley, 1993).

Studying the impact of the determinants of health demands analyzing the health impacts of recreation and park services (Raphael, 1999). Such an assessment strategy will necessitate building on the evidence compiled by the CPRA. Edwards (1999) has noted that contributions to the literature base on the determinants of population health require explorations of determinants and health "rather than determinants and disease" (p. 10).

This project utilized the knowledge and tools already available in the recreation profession to empirically demonstrate the contribution that recreation programs and services can make in meeting provincial health goals and serve as part of healthy public policy. Healthy public policy is any policy that creates a context of health (Rachlis & Kuschner, 1989). The purpose of this project was to build on, and move beyond, the knowledge base of the benefits of leisure to document the effects of public sector recreation activities as a determinant of health. By determining recreation as a significant player in the health of adolescent women, it is hoped that long-term patterns of positive recreation and health practices can be developed and a sense of control over the decisions that affect their lives can be fostered.

Resources, Policies, Feasibility

The focus of the BC Centre of Excellence for Women's Health (funding agency) is to improve the health of women by fostering collaboration on innovative, multi-disciplinary research endeavours that focus on women-centered programs and health policy. This vision coincides with a need felt by recreation practitioners at the Burnside-Gorge Community Association (community service delivery agency) who were aware that vulnerable female adolescents were being only marginally served in their community. Young women shied

away from or were not encouraged to participate in activities that might facilitate their well being. A program such as 'GirlPower' was seen as being able to contribute significantly to the programs and services already offered. The fact that the program is seen as a success, funding to sustain the 'GirlPower' project and to move into additional such programs for both young men and women at the Burnside-Gorge Community Centre has already been secured from the BC Attorney General's Office.

Public's Perceptions of Needs

Initial assessments of community issues for the participating adolescents included isolating information deemed significant in the development of young women. These included data about: self-esteem / self-confidence; body image; discrimination, culture and power; family relationships; gangs; staying in school; education and employment; being part of a group — "belonging"; skills for healthy living; eating disorders; and sex - safety and prevention. Surprisingly, the initial assessment found these young women not only passionate about their health, but also determined to be the ones to choose activities that they wanted to participate in and become better at. Paramount to the participants was a lack of control over their lives and a sense of independence and empowerment. These issues are common to many young women (Henderson & Grant, 1998). During a final evaluation of the program that took place during May and June, 1999, participants repeated the health surveys and responded to summative questions about the program in a way that allowed them to individually reflect about their experience in GirlPower. To date, successes have been found in the nature of the participation process (the participants feel like this is *their* project) and in the attainment of objectives (participants have chosen activities that have focused on physical health, self-development and self-esteem). The GirlPower case study will be analyzed in terms of a youth recreation planning model (Allen, Paisley, Stevens & Harvey, 1998) which is designed to maximize the impact of programs for at-risk youth (Table I).

Conclusion

GirlPower has been a ten-month, weekly recreation program focusing on health in an urban inner-city locale. Eighteen young adolescent women at-risk of health inequities participated. The project addressed the major health issues of self-esteem, and individual and group empowerment through participatory planning strategies.

PARAMETERS OF PLANNING RECREATION PROGRAMS FOR AT-RISK YOUTH	GIRLPOWER
➥ Plan the program based upon anticipated outcomes and impacts	✓ Benefits Catalogue & BC Health Goals defined outcomes & impacts; participants further identified health issues and indicators of success
➥ Focus on building resiliency in participants	✓ Use of initiative games, fund-raising activities, problem-solving / decision-making activities
➥ Encourage and allow participants to be involved in the planning process	✓ From defining the health issues to designing weekly activities, the participants have been directly involved in the planning of GirlPower
➥ Understand that recreation programs can be adapted to real-life issues & that recreation can be developmental, rather than simply diversionary	✓ Opportunities for self-reflection and group development occurred on several occasions, e.g., Fireside Chat with popcorn re: overcoming personal challenges
➥ Conduct a program evaluation as a general part of the programming process	✓ Informal & formal process evaluation occurred throughout by participants, leader, manager, P-I and Burnside-Gorge coordinator
➥ Use the following programming principles every day:	
· provide opportunities for participants to feel competent via consistent opportunities to successfully accomplish tasks	✓ participants responsible for refreshments, field trips, weekly activities
· provide opportunity to develop a close bond with at least one adult who gives needed attention and support	✓ the project leader has been with GirlPower since its inception and has developed a close rapport with many of the participants
· provide opportunities to socialize with peers and adults who can serve as role models	✓ weekly socialization with peers, project leader and community centre coordinator and occasional interaction with researchers
· provide opportunities to be helpful to others	✓ participants initiated a community gift program for the Salvation Army
· create opportunities for problem-solving and group decision-making through initiative and cooperative types of games	✓ when decision making was difficult, the project leader initiated games to help with problem-solving skills (approx. 6-10 times)
· create opportunities to deal with setbacks	✓ participant fund-raising activities overcame budgetary constraints
· provide a high degree of participant responsibility	✓ participants responsible for planning all activities, facilitated by leader
· provide consistent encouragement	✓ leader and participants exhibit supportive behaviour for each other
· discipline without criticism	✓ community centre coordinator and project leader demonstrate boundaries and limits to behaviours for participants
· provide unconditional support and universal acceptance	✓ participants are non-judgmental and accept others regardless of maturity level, and despite wide variation in developmental stages of adolescence

Table I. Youth Recreation Planning Model

Preliminary analyses of the data reveal that a wide range of activities, including but not limited to physical activities, were not only preferred by the participants, but developed skills and resiliency transferable to other life situations. A significant component of GirlPower, one recommended in the literature (Henderson & Grant, 1998) and by our participants, was a place of their own, free of judgment and discrimination, in which young women were encouraged to make decisions and speak freely. Data analyses of pre- and post- program health habits and self-perception indicators (self-esteem, body image, friendship, athletic competence, social acceptance, global self-worth and behaviour conduct) and the summative impact of the program are currently underway.

The overall financial cost of delivering GirlPower totaled just over $6 000 or $8.33 per participant per week, which supported program activities and leader wages in the modest setting of the Burnside-Gorge Community Centre. The GirlPower experience confirms the findings of a previous report by the National U.S. Recreation and Parks Association which stated: "the delivery of high quality public recreation experiences for all people, including those most in social or economic need, do not typically require 'exotic' institutional" facilities or structures (Tindall, 1995, p. 89). Media response to this report included the suggestion by Time magazine on November 14, 1994

> that if there is a 'proverbial magic bullet' for this nation's identity crisis it may be right under our collective nose. It is the nation's public recreation and park services, resources and institutions and the citizens and professionals dedicated to public services associated with them. Collectively, they move public recreation 'beyond fun and games,' to the higher status of 'essential services' (Tindall, 1995, p. 93).

The authors of this report agree and hope to demonstrate with GirlPower findings that public recreation goes 'beyond benefits' and serves as a legitimate determinant of population health.

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Communicating Mathematically: Writing

Werner W. Liedtke

How do students in grade seven feel about writing as a part of their mathematics learning? Will the inclusion of writing tasks throughout the school year be sufficient to have those have negative feelings about the value of writing change their opinions? To find the answers, a yearlong project was carried out.

Introduction

According to the *Mathematics K to 7 Integrated Resource Package* (IRP) (Ministry of Education, 1997), *communicating mathematically* is one component of *mathematical literacy* which is the main goal of the elementary mathematics curriculum. It is stated that the new curriculum "emphasizes discussing, writing and representing mathematical thinking in various ways" (p. 3). Although the framework of the IRP (pp. 2-4) does not make any specific reference to conceptual knowledge, the components of *mathematical literacy* that are identified and described make it clear that in order to prepare students for the demands of further education and the workplace, an emphasis on developing this type of knowledge is required. What are some important indicators or components of conceptual knowledge? Van de Walle (1994) suggests that students who are able to do a procedure conceptually can think, talk and write about it. The author indicates that the following lines written about a language approach to reading are applicable to teaching mathematics:

> *What I can do, I can think about.*
> *What I can think about I can talk about.*
> *What I can say, I can write.*
> *What I can write, I can read. The words remind me of what I did, thought, and said.*
> *I can read what I can write and what other people can write for me to read.* (p. 33)

The Project: Purpose and Goal

It is unlikely that many of those who currently teach mathematics had an opportunity to experience writing as a part of their mathematics learning. The inclusion of writing activities as part of their teaching may not appear natural or even appropriate. When students in the upper elementary grades are asked to do extensive writing as part of a mathematics lesson, reactions by some are clearly indicative of the opinion that, *This is not mathematics!*

The goal of the project was to include a wide variety of types of tasks as part of the mathematics program without actually stating or emphasizing to the students that these tasks were in any way special or part of a different program. The intent was to find out whether the mere inclusion of these writing tasks could contribute to some students changing their opinions about the role of writing as part of mathematics learning.

The Project: Procedure and Activities

A grade seven teacher was contacted during the summer of 1997 in order to determine whether or not the ideas of this project could be made part of the ongoing program of teaching and assessing mathematics. After reaching agreement, another meeting was held to modify the IRP *Sample Self-Assessment Checklist* (Appendix D, p. 28) to include statements about writing and to outline the procedure for the 1997-98 school year. The following statements were made part of the checklist:

a. Writing can be an important part of learning mathematics.
b. Sharing ideas in mathematics can involve writing.
c. I enjoy writing about mathematics
d. Reading the writing of others can show me different ways of thinking about mathematics.

The revised checklist was administered during the first and the last month of the school year.

Although it is suggested in the IRP that the K-7 mathematics curriculum emphasizes writing (p. 3), the actual document contains very few specific suggestions for writing tasks. Instructional strategies for integrating such tasks into lessons or units are not included.

Results from recent informal surveys indicate that writing is not a prevalent activity in the mathematics classroom. The most common type of task seems to be related to having students prepare entries in journals. (Perhaps that is one reason for a session at the 1998 National Council of Teachers of Mathematics Regional Conference entitled *Tired of Math Journals? Here Are Some Ideas to Liven Up Communication in Mathematics*.)

The purpose of the project was not only to make writing part of the mathematics programs, but also to include a wide variety of tasks that would enable students to think about mathematics learning in different ways. Meetings with the classroom teacher were held to discuss upcoming unit topics and possible ideas for writing. A senior education student assisted with searching for appropriate ideas by examining provincial, national and international journals and summarizing the data that was collected.

The inclusion of the specific writing tasks is beyond the purpose of this brief summary. However, several general headings and categories are described to illustrate a sample of the ideas that became part of the ongoing program. The categories of writing activities suggested by Davison and Pearce (1988) provided guidelines for types of tasks. *Linguistic translations* included writing algebraic summaries out in words, explaining meaning of symbol in formulae; translating formulae into words and writing out steps to solve procedural problems (e.g., $276 \div 23$). *Summarizing* included recording notes from memory, describing how to solve a problem, eg:

$$\frac{40}{100} = \frac{x}{75}$$

and reactions to mathematics being studied. Writing their own story problems was part of *applied use of language*. *Creative use of language* included the opportunity to write short papers on important people and events in the history of mathematics.

Buschman's (1995) article entitled, *Communicating in the Language of Mathematics*, provided another rich source of ideas. The author discusses such tasks as journal writing, student authored problems, the mathematician's chair, cooperative learning activities and parent newsletters. Fourteen categories or "structures" are presented to give students a framework that supports and enhances the process of mathematical communication. These structures were modified and adapted to generate a range of writing tasks. Some of these were rather specific (e.g. create a problem and write about the answer arrived at by an imaginary person), while others were of a very general nature [e.g., creating a mathematical storybook (Walgren, 1997)].

When given an opportunity, there are students who will come up with some rather ingenious creations. The example that follows is included simply for the reader's enjoyment. The author is Linda Cohen, who at the time of writing was a sixth grade student in Longmeadow, Massachusetts. Her story appeared as part of the *Readers' Dialogue* in the *Arithmetic Teacher* (1981). It seems safe to assume that after a unit on geometry, the students in this classroom were challenged to create a story using the terminology from the unit. Linda's creation is entitled, *Chaos in Ius—A Geometrical Fairy Tale.*

> Once upon a time there was a knight and his name was Cir Cumference. Cir Cumference lived in a town called Ius. He was not a rich prince, but a poor knight desperately in love with the lovely Maid Minor Arc. Her father was Major Arc, who fought against the invaders in a raid of their town, Ius, which was called "Raid of Ius" or "Radius." But poor Cir Cumference! He could not marry Maid Minor unless he showed he was worthy of her, and how could he do that? You see, Cir Cumference was not really a knight of high honor (he had not even fought in a battle). The only thing he did was play the piano. He wrote a lovely song for Maid Minor called "Inscribed Angel" (which, by the way, was made up of two chords), but she only laughed and said, "For this you believe you are worthy of me? Ha!"
>
> One day while Cir Cumference was thinking of a new way to prove his worthiness to Minor Arc, he heard his mother calling him. (His mother's name was Semi-Circumference, but her maiden name was Semi-Circle. Her father was Full Circle, a great blacksmith known throughout the land for his fine work.) "Come here dear. Major Arc is here to see you." Cir Cumference bowed his head in honor of the great war hero. "Yes, sir, you wished to see me?"
>
> "Yes I did!" Major Arc boomed. "That crazy dragon, Amiter, has captured my poor daughter in his cave and will not let her out. I have heard that you wish to prove your worthiness to my daughter, and what better way than this!" Cir Cumference thought about this for a minute and said, "Yes, I believe I will try it."
>
> "Fine" said Major Arc and handed him a map of where to find Amiter's cave. "If you succeed, you shall have the hand of my daughter in marriage."
>
> Cir Cumference started out at once, packing a bag with weapons and provisions. It was very hot out—in fact, it was 360 degrees—and it was a hard journey. When he reached the cave he shouted "Amiter! I

know you are in there! Give me the maiden at once, you coward!" When Amiter heard this he went off on a tangent, "A coward, I? Never!" He flew at Cir Cumference, but Cir Cumference was too quick for him. Cir Cumference pulled out his sword and stabbed the dragon, as he shouted "Die Amiter!" And of course Amiter did die. Cir Cumference then ran into the cave and scooped up Maid Minor and took her back to her home. "Oh, Cir Cumference I will be eternally grateful. How can I repay you?"

"By marrying me, fair maiden."

"It is done then."

And so, the two lived happily ever after until they grew old and grey, but yet still cheerful, rosy, plump, and round!

THE END

My first reaction after reading this amazing story was, "I am glad she was given the opportunity. Without it, this fascinating and unique tale would not exist."

Results and Recommendations

There were thirty-one students (F=11; M=20) in the classroom that was part of this project. The question, *Can the subtle inclusion of writing activities as part of the mathematics 'program contribute to having students influence their opinions about the role and importance of writing as part of mathematics learning?* was answered by identifying students who had responded in a negative way to the checklist items about writing in September and examining the responses by these students to the same statements in June.

Ten students (F=5; M=5) changed their minds and indicated at the end of the year that: *Writing can be an important part of learning mathematics*. Sixteen students (F=4; M=12) had changed to agree with the statement that: *Sharing ideas in mathematics can involve writing*. The responses from eight students (F=2; M=6) changed from negative to positive for: *I enjoy writing about mathematics*. The response to: *Reading the writing of others can show me different ways of thinking about mathematics* changed for eleven students (F=4; M=7).

Those who changed their responses about the role/importance of writing were asked to make a few statements about why they thought that was the case. Some interesting comments were elicited. Two students suggested that, "*writing can contribute to remembering*," and several made comments similar to the student who wrote, "*reading the writing of others can give you new ideas and help you get more ideas*." During the final meeting with the teacher the question about the somewhat uneven response results between females and males was discussed. A few possible reasons for these differences were discussed without arriving at a plausible conclusion. Perhaps this difference in responses deserves some further attention.

Writing can and should be an important part of communicating mathematically and mathematical literacy. A range of important learning outcomes can be accommodated through activities that involve writing. In order for the new curriculum to live up to its promise of "emphasizing writing" and in order to be of benefit to teachers and their students, a list of specific writing tasks could be included in future editions. However, more than a list of specific writing ideas is needed. Special teaching strategies and questioning techniques are required to get students to think and to think about their thinking (Garofalo, 1987). In order to maximize the benefits of math tasks that involve writing, suggestions for possible introductions, types of questioning, and sample follow-up tasks could be included in the Mathematics K-7 IRP.

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Using the Repertory Grid in Teacher Education: Reflective Thought Objects, Story and Metaphor

Tim Hopper

This paper represents a framework case study for a series of ongoing studies that have used a repertory grid technique from personal construct psychology (Kelly, 1955). The findings that are reported are from a larger study of ten pre-service teachers who were enrolled in the same physical education teacher preparation course (Hopper, 1996). The findings focus upon one pre-service teacher.

Purpose of the Study

The purpose of the study was to interpret how pre-service teachers reflectively evolve their personal beliefs and values about teaching after their initial experience of teaching in schools. The following question was addressed: given the findings of a study of pre-service teachers' personal constructs for teaching, how does one pre-service teacher (Ted) articulate his sense of becoming a teacher? In other words, how did Ted learn, and know he had learned, how to teach? The answer provided insights into how 'thinking like a teacher' evolved for one pre-service teacher.

Method for Personal Meaning Making

A repertory grid analysis from George Kelly's (1955) personal construct psychology was employed to investigate pre-service teachers' beliefs about teaching. Personal construct psychology (PCP) is a procedure used in psychotherapy. It offers a way of becoming aware of the biography that structures and guides a person's subjective judgments about a certain reality. PCP has been widely used in teacher education as a means of accessing pre-service teachers implicit beliefs about teaching (Diamond, 1991; Pope & Keen, 1981). As part of PCP, Kelly proposed a theory called constructive alternativism. This theory states that reality is subject to many alternative constructions. Kelly's PCP allows a person to probe the multiple meanings people can have of the same phenomenon.

This study probed the meaning of effective teaching in physical education. The repertory grid from PCP was used to explore "new" meaning about teaching. As shown in Figure 1, the grid creates a number pattern of ordinal ratings of elements on dichotomous constructs. The elements come from a pool of elements that are familiar to the participant. The elements used were related to teacher roles that had been experienced by all the pre-service teachers during their school days and during their experiences at the university. The constructs are bipolar descriptors, produced by participants from comparisons of elements representing different teachers. To produce this repertory grid, a one to five rating scale was used to rate each of the elements on each of the bi-polar constructs.

Research Design and Data Collection

Data for the repertory grids was collected at the beginning of a teacher preparation course in physical education. Initially, the course ran for six weeks.

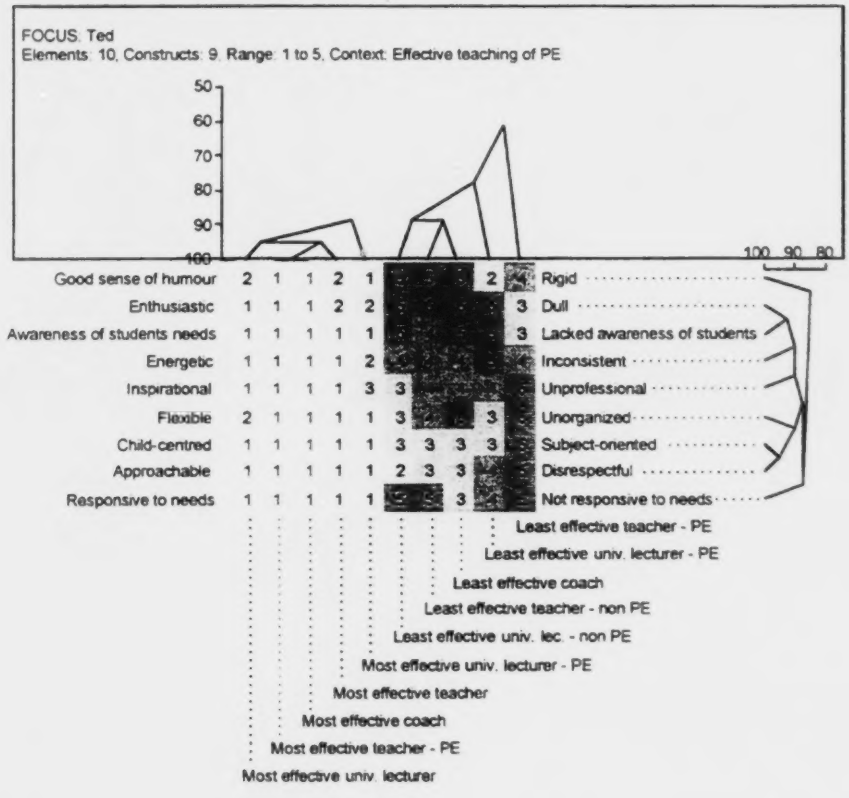
FOCUS: Ted
Elements: 10, Constructs: 9, Range: 1 to 5, Context: Effective teaching of PE
50
60
70
80
90
100
100 90 80
Good sense of humour 2 1 1 2 1 2 Rigid
Enthusiastic 1 1 1 2 2 3 Dull
Awareness of students needs 1 1 1 1 1 3 Lacked awareness of students
Energetic 1 1 1 1 2 Inconsistent
Inspirational 1 1 1 1 3 3 Unprofessional
Flexible 2 1 1 1 1 3 3 Unorganized
Child-centred 1 1 1 1 1 3 3 3 3 Subject-oriented
Approachable 1 1 1 1 1 2 3 3 Disrespectful
Responsive to needs 1 1 1 1 1 3 Not responsive to needs
Least effective teacher - PE
Least effective univ. lecturer - PE
Least effective coach
Least effective teacher - non PE
Least effective univ. lec. - non PE
Most effective univ. lecturer - PE
Most effective teacher
Most effective coach
Most effective teacher - PE
Most effective univ. lecturer

Figure 1. Ted's initial repertory grid

For these six weeks the course concentrated on inquiry-oriented conceptual approaches to learning. Emphasis was placed on responding to the play of learners and developing learner autonomy. This was done through demonstration lessons by the course instructor and by encouraging the pre-service teachers to attempt similar approaches in peer teaching experiences. After this six weeks the pre-service teachers engaged in a four-week field experience in the schools. Then they returned to the university for three weeks to complete course requirements. During this time the pre-service teachers engaged in a second learning conversation and re-rated their initial repertory grids. The new repertory grids included an element representing the pre-service teacher. The main purpose of this learning conversation was to explore how the pre-service teachers' beliefs and values about effective teachers had changed as a result of their teaching experiences.

All conversations were transcribed. The transcripts averaged to about 10000 words. This data was summarized for each pre-service teacher in personal case studies that ranged from 3000 to 6000 words. A year later, a further interview with the author about possible special thoughts and concerns resulted in "interview three" of the study. The transcripts from these interviews ranged from 2000 to 3000 words in length. Several of the pre-service teachers met with the author on an informal basis during the subsequent academic year to share teaching experiences that they felt revealed their articulated beliefs and values about effective teaching.

Data Analysis

The computer program GRIDTHINK was used to analyze the repertory grids. This program provides a two-way cluster analysis that re-orders the rows of constructs and the columns of elements to produce a grid with the least variation between adjacent constructs and elements. The relationships between elements and constructs is visualized as tree diagrams showing clusters that indicate the closest relationship between number clusters (see Figure 1). Analysis of the conversation about relationships between elements and constructs produced certain themes that the student teachers referred to as a reference for the effectiveness of teachers. These themes were defined as "thought objects" for teaching.

A conversation about the repertory grid generates a commonsense meaning rather than a technical meaning. The type of commonsense meaning that is developed in conversation between two people is generally constructed with metaphor. The metaphorical content of teachers' speech has promise for discerning the implicit ways in which teachers construct their professional

world and the imagery they use to construct their world of teaching. Conversations between the pre-service teachers and the author involved a sharing of stories on teaching that supported beliefs about effective teaching. The pre-service-teachers' stories about their teaching practice became self-affirming and representative of educational values being transformed into practice.

Findings

The participant, Ted, was in his final year of a four-year, combined honors degree in French and Physical Education. He was in his late twenties and had extensive experience playing and coaching ice hockey, karate and football. The first interview focused on Ted's initial repertory grid (see Figure 2). During the interview, it was established that the clusters of the bi-polar constructs associated to the themes of *Relate to students* and generating *Energy* in the class. These themes were labeled as the "thought objects" of Ted's reflexive thinking about teaching.

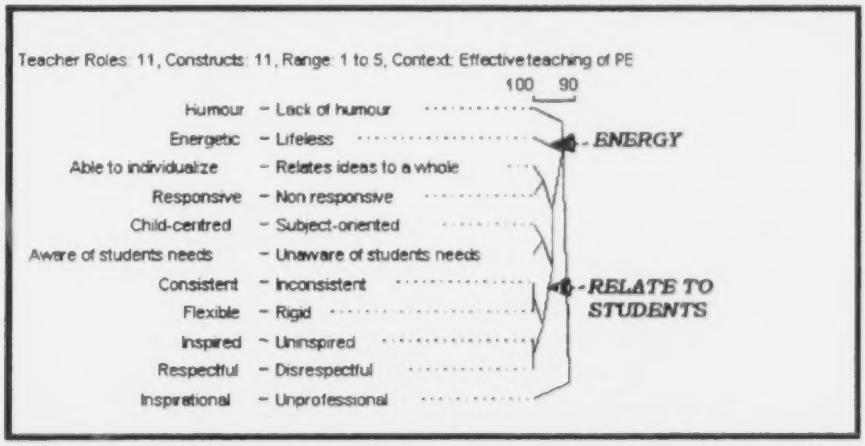
Teacher Roles: 11, Constructs: 11, Range: 1 to 5, Context: Effective teaching of PE
100 90
Humour – Lack of humour
Energetic – Lifeless
Able to individualize – Relates ideas to a whole
Responsive – Non responsive
Child-centred – Subject-oriented
Aware of students needs – Unaware of students needs
Consistent – Inconsistent
Flexible – Rigid
Inspired – Uninspired
Respectful – Disrespectful
Inspirational – Unprofessional
ENERGY
RELATE TO STUDENTS

Figure 2. A summary of Ted's bi-polar constructs in his repertory grid

Ted conducted his practicum in an inner city junior-high school. The children in the school came from middle to low income families. Ted felt the school created a system that focused teachers toward subject-centered, controlling practices; it did not support dealing with children in a child-centered, more personal and individual way.

After the practicum, Ted re-rated his selected teachers on his initial bi-polar constructs. The new grid indicated that his perceptions of his past teachers had changed. The new clustering of Ted's bi-polar constructs based on his re-

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rating of his past teachers is shown in Figure 3. As can be seen, Ted maintained the original "thought objects" of *Energy* and *Relate to students*, but now he also focused upon the need for a teacher to be *Respectful*. This new "thought object" is generated from a new clustering in the re-rated grid and is connected to the *Relate to students* idea. Its importance to Ted is highlighted in the following story from his field experience.

Ted's class included a large pupil, Michael, notorious as the city's under fifteen wrestling champion. Michael was often suspended from the school for being overly aggressive.

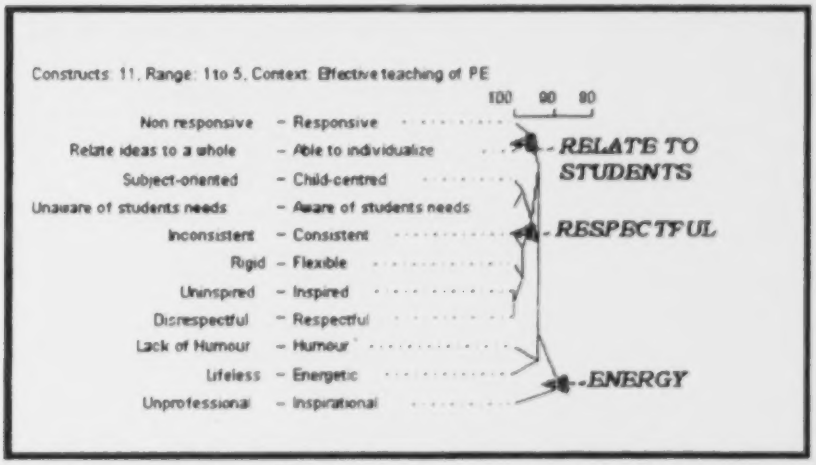
Constructs: 11, Range: 1 to 5, Context: Effective teaching of PE
100 90 80
Non responsive - Responsive
Relate ideas to a whole - Able to individualize
Subject-oriented - Child-centred
Unaware of students needs - Aware of students needs
Inconsistent - Consistent
Rigid - Flexible
Uninspired - Inspired
Disrespectful - Respectful
Lack of Humour - Humour
Lifeless - Energetic
Unprofessional - Inspirational
RELATE TO STUDENTS
RESPECTFUL
ENERGY

Figure 3. New clustering of Ted's bi-polar constructs in his repertory grid

On his initial encounter with Michael, Ted shared enthusiastically the joys of playing football, a sport that Ted knew Michael had started to play. As Ted said,

> *I never had a problem with Michael. There was one time when he was getting a bit rowdy with Cody. I said to Michael quietly, "Michael, I need your help. The kids in this class really respect you. They see you fooling around and stuff—it makes it tough on me. I know you would not want to do that on purpose. I would not do it to you, right? You know that, right?"*
>
> *Michael replied, "Yah. O.K. Mr. F., no problem."*
>
> *When Cody started fooling around again Michael slammed his big fist on the table grunting, "No!"*

As Ted explained, *"I just extended the relationship that I felt I had with Michael. I felt I could go to him, be that forward, be that honest with him. I treated him like a fourteen-year-old kid. He had a presence...Instead of just slamming down on him, I acknowledged him."*

The story illustrates how Ted was finding support in his experiences for his beliefs in the importance of *Relating to students* and being *Respectful* of students. Ted felt this story was in contrast to the advice he was given by his co-operating teacher who told him to "be tough, then loosen up." According to Ted, the difficulty about teaching was being consistent and sincere in how he believed an effective teacher should be.

An analysis of Ted's use of metaphor in his first interview revealed a physical, in contact, mobile sense of teaching which was probably connected to his six years of experience teaching karate, coaching hockey, and playing hockey as a child. When describing effective teachers, Ted made many references to teaching as a process where you had to "push," "pull" and "proceed forward." According to him, these effective teachers were "moving" work along. Ted also made many references to energy: "full of energy"; "full of life and energy"; and "pump your self up." According to Ted, this display of energy was "natural" and "contagious." Metaphorically, Ted seemed to imply that energy could be caught like a virus. For Ted humor was a vital component in teaching that energizes students. In this sense, Ted seemed to consider humor as being infectious. However, as it turned out, this metaphor of energy generated from humor did not work for Ted when he taught in a school.

After the practicum Ted's physical metaphor to understand teaching had developed with words such as "reaching," "crushed" and "squeezing." Ted's comments about his field experience school were that lessons tended to be activities that the students were just exposed to and told "to learn or else." A common response from kids was to fight harshness or to at least feel resentment." Ted felt himself rising to a level of strictness that the pupils expected. As he described, "harsher...I mean like sharp," not like "I was use to being as a coach." As Ted said, "I was fighting not to put my ideas on the back burner."

Ted's description of his teaching included the comments; "I was full of emotions...full of energy." Metaphorically, he seemed to feel that "kids feed off your energy." This idea of students "feeding" off a teacher's energy places Ted at the center, as the source of energy. However, in a negative sense, feeding off Ted's energy can create an image of a teacher being drained of energy. In Ted's words, "The kids were just feeding off it...When I went home I was exhausted."

After the practicum, Ted had a new metaphor for teaching. It focused on the teacher as researcher. He felt he was "researching" how to teach and that he "did little experiments" because according to him, "there are things I wanted to discover." The physical metaphor that had initially been apart of Ted's understanding was still present. However, Ted's hockey coaching had changed to incorporate the "researching" metaphor. Ted found himself asking his players to explore "what would happen if..."

A year later, in Ted's third interview, his sense of teaching as possible research seemed to be a fundamental part of knowing the act of teaching. Words such as "extract," "synthesize," "focus" and "connect" framed Ted's notion of teaching. According to him the key to effective teaching is, "learn from it, think about researching it and doing it... writing it down, talking about it."

During his final practicum, Ted's commitment to his "thought objects" resulted in him concentrating on being enthusiastic, energetic and also respectful to students. A story from Ted's teaching experience highlights these beliefs. He gave the following account:

> *To get the kids excited about the topic I asked them to discuss their favourite music with a friend... The door was open and the noise was rising. I realized I needed to get the children back on track, but I did not want to shout and bawl. After all, I wanted them to get excited. [Here Ted had the energy he felt was important in teaching]... I went over to Elaine. I got on well with her so I knew she would respond. [Ted drew on his experience of relating to students]. I asked Elaine, very quietly, what her favourite music was....Our discussion got very intense, but quiet. As we were talking, the rest of the class started to take an interest. In a few minutes all the class was silent—they wanted to know what we were talking about [Ted respectfully had the students quiet but they were still energized].*

Ted's alternative strategy to shouting to get control had worked. The class was excited and interested in the topic. They were 'energized'. There was no need to control them, just channel their energy. The request to state how he had come up with this strategy elicited, "I had a sense that shouting was wrong, disrespectful, I had made them excited. I needed an alternative strategy." This story along with others illustrates how Ted started to transform his beliefs about effective teaching into practice. On reflection, Ted felt that this story highlighted his new sense of energy. For Ted, energy in teaching came from the class group's energy that he, as the teacher, ignited but also drew from.

Conclusion

One participant's beliefs were articulated in "thought objects" through the conversations based on a repertory grid. For this participant these "thought objects" were gradually realized in practice. The participant's metaphorical language used to describe teaching evolved as he attempted to express the reality of teaching that allowed him to transform his "thought objects" into practice. The data from this study, and the results from other pre-service teachers, are suggestive of the potential this process has for the examination of teachers' personal thinking and their beliefs about effective teaching. As Diamond (1991) has observed, the repertory grid process creates a catalyst for teachers who are able "to compose their own narratives...chart their way through their present and towards their future stages of development as teachers" (p. 41).

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Counselling Children of Divorce

Geoffrey Hett, Jenny Spring and Zane Shannon[1]

There is a preponderance of research literature that suggests that divorce causes serious and lasting problems for some children. There is also some support for the notion that the level and intensity of parental conflict before, during and after the divorce, and not the divorce itself or the change in family structure, is responsible for the problems some children face. This article discusses the related literature and the results of a counselling program designed for children and for children and their parents to deal with divorce and conflict issues that arise.

During the past several decades the structure of the family has undergone dramatic changes. Once the predominate family form, the traditional nuclear family now occupies a position alongside a variety of household arrangements. One parent, stepparent, binuclear and blended families are increasingly becoming the common experience in the lives of children. Indeed, it is currently estimated that 40% of children under the age of 18 in Canada reside in such nontraditional family forms (Haveman & Wolfe, 1994). This changing profile of the family is due to a number of factors, but one of the most influential is the increased incidence of divorce. Demographics indicate that the frequency of divorce rate has more than doubled since the mid 1960s (Hernandez, 1988). Although this divorce rate has stabilized somewhat in the past decade, it is now predicted that nearly one half of recently contracted marriages in Canada (Dumas & Peron, 1992) and two thirds of such marriages in the United States (Bumpass, 1990) will end in divorce. Today, children are more likely to experience the dissolution of their parents' marriage than at any other time in modern history.

The large number of children whose parents have divorced has generated concerns over the consequences of divorce for these children's well being. Over the past two decades social scientists representing diverse conceptual frameworks and methodological approaches have extensively investigated the effects of divorce on children. In general, these studies have concluded that children from divorced families experience lower levels of well-being across a variety of educational, psychological and social domains than do children from non-divorced families (McDermott, 1970; Morrison, 1974; Schaettle &

Cantwell, 1980; Wallerstein & Kelly, 1980; Hett, 1983; Golombek, Martin, Stein, & Korenblum, 1984; Bonkowski, Beguette & Boomhower, 1985; Hett, 1985; Brady, Berry & Zeeb, 1986; Kalter, 1987; Robson, 1987; Amato & Keith, 1991a; Wallerstein, 1991).

It is tempting to agree with the seemingly preponderance of data in the existing literature that divorce causes serious problems for children. However, such a conclusion must be tempered with an awareness of the various methodological inadequacies, which accompany divorce research (e.g. nonrepresentative samples, poor design and psychometrically weak measures). In addition, there are some suggestions in the literature that divorce causes no appreciable effect and might even result in positive benefits for children.

While the degree of a child's suffering is of continuing concern and debate, it is the long-term effects of divorce on children's well-being that is the central issue for parents, clinicians and society as a whole. Most theories of personality, development, psychopathology and, indeed, psychotherapy are based upon the concept that there is substantial continuity between childhood experience and adult functioning. Simply stated, negative childhood experiences are seen as likely precursors, indeed causal factors, for later adult problems. Conversely, positive childhood experiences are seen as likely precursors or casual factors for later adult healthy functioning.

Amato (1993) argues that the effects of divorce are enduring. He notes that the meta-analysis study undertaken by Amato and Keith (1991b) demonstrates that "even as adults, children of divorce exhibit slightly lower levels of well-being than do people from continuously intact families of origin" (p.35). The long-term effect conclusions drawn by these researchers are, however, restricted by the design of the studies used in their meta-analysis. The designs are cross-sectional in nature and thus only provide a "snapshot" of a child's adjustment at a particular point in time. As a result, the data do not illuminate the continuity or discontinuity of a child's functioning over time. Although longitudinal research by Hetherington, Cox and Cox (1985) and Wallerstein (1991) provides important time associated insights, these researchers have also come to equivocal conclusions regarding the long term effects of divorce on children. In general, these investigators have found that although most children initially experience their parents' divorce as stressful, the long-term effects vary considerably. Some children experience both short- and long-term problems in their social and psychological functioning following their parents' divorce, while others appear unaffected. There are some who have substantial short-term problems but seem to avoid long-term outcomes. Finally, there are those children who adapt quite well early in the family's restructuring but develop problems later on, especially during adolescence. In summary, it would appear

as if there is no simple or single outcome that marks the duration, let alone continuity and discontinuity of children's problems associated with divorce.

A Counselling Program for Children of Divorce

Regardless of the disagreement that exists, the one conclusion that can be drawn from the literature is that changes associated with divorce can be stressful, confusing and challenging for most children. This information led to the development of a counselling program for children of divorce (Achtem & Hett, 1988). The goals of this program are to assist children with: understanding that they are not alone in the issues and concerns that they face; dispelling the notion that children are somehow responsible for their parents' divorce; acquiring effective communication and assertiveness skills that allow them to express their concerns and needs; mastering problem solving strategies; reducing stress and anxiety through the use of muscle relaxation; and finally, controlling any anger that might exist.

Although the program has maintained these goals over the past eleven years, the content of the program has undergone substantial change. These changes have occurred as a result of research designed to examine the efficacy of the program. The results from control group studies designed to evaluate the program showed positive effects in several areas. Children who have enrolled in this program have demonstrated improvement in the following areas: to act more independently as measured by the Nowicki-Strickland Locus of Control (1978); school adjustment measured by the Walker Problem Behavior Identification Checklist (1978); creativity and well-being as measured by the Draw Your Family Test; and the ability and willingness to discuss divorce related feelings and concerns with parents as measured by the Children's Feeling Expression Inventory (Rose,1996). (For further details about the results of these studies see Hett, 1997.)

The Addition of Parents' Groups

Aside from the issues of degree and duration, the possibility that children's difficulties begin before divorce has not been adequately investigated. Nearly every study of divorce typically begins with the decisive parental separation or legal divorce. Thus, it is assumed that any observed problems children have are the consequence of the divorce. It is possible, however, that the problems some children experience existed prior to the parental separation. If this is the case, these problems cannot be a consequence of divorce per se or the subsequent family structure. It may be that the critical issue, related to being

able to cope, is not whether a child is living with one or two parents, but rather the quality of the relationship between parents and the changes in these relationships that accompany family disruption and reformation. In other words, variables such as the level and intensity of parent conflict may be more related to children's future adjustment than the divorce itself or the subsequent family structure.

With this information in mind, Spring (1999) developed a study, which included comparing two counselling groups. One group of children received the type of group counselling mentioned in the last section, without parent involvement. A second group of children received counselling while their custodial parent attended a separate but concurrent information and counselling group. The purpose of this parent group was to provide the members with information and counselling that was being provided to their children. In addition, these parents were helped to discover ways to reduce possible conflict and improve relationships in their homes and with their former spouses.

The most interesting findings from the Spring study relate to parent conflict (labeled "parental blame") as it is measured on the subscale of the Children's Beliefs About Parental Divorce Scale (Kurdek & Berg, 1987). The group of children who had parents attend an information and counselling group showed significant gains on this subscale over the children whose parents did not attend a counselling group (F_{2}, 24 = 6.72; p <. 02). Items on this subscale include such statements as: "It is usually my father's fault when my parents fight," "When my family was unhappy, it was usually because of something my father said or did," "My father caused most of the trouble in my family," "My father is more good than bad." Results indicate that a positive view of fathers may reflect the custodial parents' (all mothers) attempt at reducing conflict within the family and with their former spouse.

Spring also found significant differences between the two groups on several subscales of The McMaster Family Assessment Device (Epstein, Baldwin & Bishop, 1983). The items on this test measure the custodial parents' perception of their family's functioning. The experimental group that included children and their custodial parent showed significantly greater gains than did the families without a parents' group on the following subscales: communication, e.g., listening to others and expressing concerns (F_{2}, 24 = 7.25, p <. 02); roles, e.g., sharing of household responsibilities(F_{2}, 24 = 15.47, p <. 001); affective involvement, e.g., placing value on each other's activities and concerns (F_{2}, 24 = 5.09, p <. 04); behavior control, e.g., expressing standards on the behavior of family members (F_{2}, 24 = 10.91, p <. 004); and general functioning e.g., assessing the overall health of the family (F_{2}, 24 = 4.29, p <. 05).

Many of these measures assessed the topics discussed in both counselling groups. What is noteworthy here is that when information is shared and skills are taught to both parents and their children, parents are in a position to encourage and reinforce these skills at home.

Conclusion

Debate continues over the issue of whether parent separation and divorce and family structure are the cause of the educational, psychological and social problems faced by some children. The notion that parent conflict before, during and after the divorce places children at risk has been suggested by clinicians and researchers. The one conclusion that can be drawn from the existing literature about divorce is that changes associated with divorce can be very stressful, confusing and challenging for most children. As a result, counselling programs to help children deal effectively with the concerns and issues they face are important. An additional advantage to children may be the inclusion of their parents in a counselling program, especially where intense and open conflict between parents is evident. Anger and conflict management to improve parental relationship may be a key variable in helping children adjust to divorce.

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Topical Structure Development in Academic English

Hitomi Harama and Robert Anthony

This report describes part of a case study of the development of academic writing features over a three year period in the compositions by an advanced ESL student from Japan. A developmental feature analysis is proposed. This study extends previous research into the contrastive features of academic writing between English and Japanese (Anthony and Harama 1996; Harama 1997).

Introduction

ESL students, and particularly students from Oriental cultures, are often considered problematic learners because of their poor writing skills (Agnew, 1994). Even students who show general English proficiency on tests of ESL such as the TOEFL or TWE (Test of Written English) demonstrate lower than expected levels of literacy for academic purposes (Bell, 1995; Carson, Carrell, Silberstein, Kroll & Kuehn, 1990; Connor, 1996).

In second language education it is generally recognized that academic writing involves the use of elements of composition which are distinct from other forms of writing in English (Connor, 1996; Gutierrez, 1995; Hyland, 1994; Kusel, 1992). When writing does not exhibit these features it is negatively regarded as disorganized and incoherent (Cai, 1993; Hinds, 1987, 1990; Silva, 1990). Most native English speakers become familiar with the appropriate conventions through their long educational experience. However, this cannot be assumed nor anticipated for non-native speakers whose literacy skills were acquired in a different culture even if their general language proficiency in English is quite advanced.

Recently the study of textual differences between languages termed *Contrastive Rhetoric* (Connor & Kaplan, 1987; Johnson & Roen, 1989; Purves, 1988) has emerged as an area of focus. However, while the general notion of rhetorical contrast has been widely accepted, there is little research that identifies the particular features which contrast across specific languages and cultures. Japanese is one language which provides fundamental evidence of contasting rhetorical features (Cai, 1993; Connor 1996; Hinds 1982, 1987, 1990; Kubota, 1992; Oi & Kamimura, 1995). However, the identification of distinctive

rhetorical features in texts written in Japanese compared to texts written in English does not demonstrate that these features have a role to play in the English compositions written by Japanese ESL students. It remains to be shown that the contrasting features of Japanese rhetoric influence composition in English.

Writing Samples

The subject in this study was an international student from Japan studying for a Master's degree at the University of Victoria. Although a second language speaker of English, the level of vocabulary and fluency in English would be regarded as very proficient by any standard. It was fortunate that copies of all the compositions that had been written by the subject since first coming to Canada as an ESL student four years earlier existed. The participating subject assisted the research by providing the examples and in addition described the contexts in which the compositions were produced as well as other details about the instruction related to each composition. Six samples were selected for detailed examination. These were chosen from consecutive periods spanning two years, from the initial ESL classes in Canada through the undergraduate period. The first three samples were non-narrative writing assignments from the ESL period, and the remaining three were regular undergraduate course work assignments. Only final versions submitted for grading were analyzed. As far as could be determined, the assistance of classmates prior to submitting an assignment was limited to proofreading for word choice and grammar and did not involve textual re-organization.

Method of Analysis

When describing the unconventional features of coherence in the writing of Japanese students terms such as, "incoherent", "disjointed", even the "three-foot monster" (Cai, 1993) have been used. Such descriptions indicate that an unacceptable feature of writing has been identified, but the character of that feature is wholly obscured. Furthermore, it is possible for different native speakers to come to different conclusions about the degree and scope of the "incoherence". Thus there exists a tremendous need to develop a systematic way of describing coherence.

Topical structure analysis is one approach under development (Connor & Farmer, 1990; Schneider & Connor, 1991). This form of analysis results in a schematic representation of the relationship between topics in a passage. The

key term for the topic of a sentence is identified. Then, if this topic is the same as the topic of the previous sentence, it is recorded directly below the previous topic. If the topic of the sentence is less closely related, then the topic is indented below the former topic. In other words, the more distantly related the topics in a sentence are from one another, the greater is the lateral distance between the key topic words.

The presentation of the topical structures of the examples referred to in this paper is the result of several analyses to insure reliability. First, the topical structures were independently determined by two separate analysts and then compared. In most cases the divergences only involved the degree of topic shifting, but not major rhetorical constituents. Secondly, the subject was available to provide guidance about intended logical structure of the text and thirdly, many of the samples were available with the teachers grading comments. For example, a suspected divergence of topic could be confirmed by a teacher's marginal note such as a "?" or "?logic?" or "unclear".

Features of Contrastive Rhetoric

Central to identification of development features between Japanese and English texts is the identification of several major features. These features are selected for analysis because they have previously been identified as contrastive features between English and Japanese rhetoric (Harama, 1997; Hinds, 1990; Kubota, 1992).

Parallel and sequential textual patterns: When topics are repeated in sentences they are diagrammed in a vertical form termed "parallel structure". When a topic is elaborated or expanded, the gradual shifting of topic is diagrammed as a "sequential pattern". Sequential shifts of topic are conventional in English texts. It has been observed that novice writing by ESL students is characterized by a great deal of repetition and thus parallel text structure.

Inductive and deductive textual patterns: The most common type of North American academic writing is often referred to as a "five paragraph theme" (Nunnaly, 1991). In this form of writing a topic is expected to develop in a deductive manner. The topical development begins from a general statement of the theme and proceeds through a sequential elaboration. The topical diagram in Figure 1 shows the characteristic deductive or right-branching structure. This structure is not the only pattern of topic development in English, but it is the most prevalent.

1. 1) *Thesis topic*
   2) *overview of topic organization*

2. 1) *first topic statement*
   2) *specific evidence*
   3) *specific evidence*

3. 1) *second topic statement*
   2) *specific evidence*
   3) *specific evidence*

4. 1) *third topic statement*
   2) *specific evidence*
   3) *specific evidence*

5. 1) *overview of contents*
   2) *topic summary*

Figure 1. Topical Structure of a Deductive Five-paragraph Theme

The crucial difference between a deductive and inductive text is the placement of the main topic. In an inductive text the main topic is stated at the end of a sequence while in a deductive sequence the main topic statement is placed at the beginning. When diagramming the topical structure of an inductive passage, the placement of the most general topic is placed in the left most position and the pattern of specific statements flows from right to left (see Figure 2). The initial statement of a topic is conventional in most English academic prose, so the absence of an appropriate initial statement of the topic could be regarded as suggestive of an inductive text.

1) *specific evidence*
2) *specific evidence*
3) *general topic statement*

Figure 2. Topical Structure of an Inductive Passage

Just as the five paragraph theme is a familiar textual pattern in English, there is a typical academic rhetorical pattern in Japanese, *ki, shoo, ten, ketsu*. What is particular distinctive about the Japanese topical pattern is the preference for an inductive pattern of topic development and the expectation for a much broader divergence of topics in a passage especially in the *ten* portion of the text.

This inductive rhetorical pattern is highly valued by speakers of Japanese and is often used as a model of good Japanese writing in much the same way that the five paragraph theme is the model in Canada. It is important to notice that this Japanese conventional form is quite distinct from the topical pattern of western academic composition. In the Japanese context, inductive topic development and broad topic shift are the epitome of logical clarity, although this fact sometimes escapes westerners who have difficulty identifying the topical coherence in Japanese rhetoric.

Delayed topic: The English essay conventionally begins with a direct statement of the central topic. In Japanese rhetorical structure it is more conventional to delay the statement of the main topic until after a more general implication of the topic. From the perspective of English academic rhetoric, the arrangement of the main topic could be delayed several paragraphs.

Restatement: The restatement of the topic at both the beginning and the end of a passage is generally regarded as good expository style in English. It is a restatement not a repetition because although the content is parallel, the wording is expected to be different. In Japanese the opening and closing are generally not a restatement but rather two separate implicative reflections on the central topic which are not parallel in content..

Topic unity: The conventional topical structure in Japanese includes an implicational extension of the main topic usually just before the concluding paragraph (*ten*). This extension is often metaphorical or personal and quite unlike the English convention where the elaboration of the main topic is very narrowly constrained. Topic unity in English is much more restrictive than in Japanese. The implicative *ten*-shift contrasts markedly from the English convention.

Textual cohesion: There are a number of conventional cohesive markers in English such as "first", "in addition", "finally", "in conclusion", which are used to signal the sequence of topics in a text. These overt markers are not required for topical coherence in a passage, but they are stylistically conventional for academic writing.

Rhetorical Feature Development

Each of the ESL texts examined in this case study contained some features that are not conventional for English expository writing. All texts retained some features which indicate transfer of Japanese rhetorical patterns into English. Although the structure of the English essay was taught to the student before

and also during the time these examples were written, the instruction was not insufficient to permit the ESL student to utilize the conventional rhetorical scheme of English. A number of rhetorical features are plotted for each of the writing samples. The presence of a feature is indicated by an X. A summary of these features is presented in Figure 3.

	FRIENDS Sep/93	TRAVELER Jan/94	STORIES Feb/94	GENDER Oct/94	2 POETS Apr/95	WOMEN Oct/95
Parallel pattern	X					
Sequential inductive		X				
Sequential deductive			X	X	X	X
Delayed topic			X	X	X	X
Restate-ment			X	X	X	X
Topic unity				X	X	
Textual cohesion				X	X	X

Figure 3. Developmental Sequence of Writing Features

The data in Figure 3 indicate four developmental features. First, the early shift from parallel to sequential topic structures. Secondly, the shift from the use of inductive sequence to the more conventional deductive sequence in English. Both these developmental changes occurred quite early in the acquisition of academic English. They reflect a shift from a non-conventional pattern to a conventional English pattern of topic organization. Shortly after the appearance of sequential patterns of presentation, a preference for placing the main topic first occurred, that is, a deductive sequence appears. Based on the author's information, there had been no explicit instruction in using a deductive topic sequence, which could account for the rhetorical shift.

A third developmental feature is the incorporation of two fairly mechanical organizational structures, topic restatement and cohesive markers. These features were an explicit part of the instruction in using the five-paragraph-theme pattern at about the time they appear in the collected examples. Like the

previous two, those are conventional structure features which the student incorporated within a year of immersion in a Canadian academic setting.

In contrast, the fourth observation is the persistence of two features of Japanese rhetoric in English writing, delayed topic and topic unity. Neither of these features is conventional in English, yet they continue to appear in the student's writing long after other English conventions like deductive sequences and topic restatement have been adopted. Unlike the previous features, these are not essentially structural in character, but rather semantic.

Implications for Instruction

When analyzing the writing samples, it was possible to examine the comments made by the teachers on the student's papers. One particularly noteworthy feature was the frequent notation "illogical" and "unclear" along the margins. This analysis accounted for these logical digressions in terms of topical structure and topic unity, but from the point-of-view of the teachers, only a lapse of logic was apparent. The persistence of the teacher's comments about logic and the persistence of a typically Japanese topic-shift indicate a failure of communication between the teacher and the student. The teachers were not able to explain their identification of a problem with the logic and therefore the student was not able to remediate the feature.

Observations shared by the student participant assisted the data interpretation. On one occasion the feature of topic shift was discussed and the subject immediately began to re-read some of the samples. After a brief moment there was a sigh of recognition as the essays were scanned and places where topic-shift existed were identified. Following this discovery the subject expressed puzzlement that no one had pointed this out before. Knowledge of topical structure on the part of teachers and students can provide a potent tool for communicating about textual coherence.

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A Resource-Based Learning and Teaching Inservice Program for Elementary Teachers: Victoria '98

Donald Hamilton

This project provided an intensive inservice experience for 234 elementary teachers from every school district in British Columbia in July 1998. Funded primarily by the Ministry of Education, the program successfully introduced and examined "resource-based learning and teaching" concepts as a strategic approach to meeting selected goals of the new curricula in the province.

Background

New curriculum approaches in British Columbia called for the adoption of resource-based teaching methods. These approaches were introduced without an adequate upgrading and/or updating of the existing teaching population. It became apparent to many teacher-librarians and resource personnel across the province that many teachers were unable to fully realize the potential of the new approaches without extensive examination of their role in a resource rich environment that depends on their own ability to select, delineate and utilize a wide range of resources in the classroom. It also became apparent that it was necessary to provide a retooling opportunity for teachers in a format that maximizes the efficacy and effectiveness of such instruction without significant costs to individual teachers, school boards or the Ministry. These considerations contributed to the conception and production of Victoria '98 – and inservice program for elementary school teachers.

The Program

The original proposal from the Ministry of Education charged the University of Victoria to develop four weeklong immersion programs for 240 elementary teachers (60 per session) selected from 240 different schools throughout the province for the summer of 1998. The participants were invited to attend a six-day immersion program. An *immersion model* was used to design the content and structure of this program. An attempt was made to employ an approach where the significant values of adult interaction, extensive experience and

intensive communication are not lost to outside pressures. Immersion requires close interaction of instructor and students in a highly structured situation. Participants had the opportunity to fully utilize the shared wisdom of the group. Given the shortness of time, it was imperative to maximize the learning experience. Housing and meals were provided on campus. Two full time on-site instructors supplemented by several part-time instructors and guests delivered the different components of the program. The program consisted of full days (9 a.m.- 9 p.m.) of lectures, demonstrations, discussions and guest speakers (See Figure 1 for a program timetable).

	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
7:30		Breakfast	Breakfast	Breakfast	Breakfast	Breakfast
8:30		Introduction A Planning for effective RBL (Rationale)	D Identifying Learning Resource Formats Characteristics	B Theory and Criteria for Evaluation	C Managing learning resources-Access Staffing	E Assignment-Complete implementation plans-Individual (Lab)
10:00		Coffee	Coffee	Coffee	Coffee	Coffee
10:30		A Planning for Effective RBL (Resource Networks & Instructional Strategies	D (Continued) Application & Future Development	B Hands-On Resource Evaluation	C (Continued) -Organizing-Budgeting -Promotion -Copyright	E Small Group feedback on Implementation Plans-Course evaluation-Close
noon		Luncheon	Luncheon	Luncheon	Luncheon	Luncheon
1:00		A Information Skills/Tech Skills (Lab)	B Selection Process -Sources -Acquisition -Funding	B CD-ROM Software Internet Evaluation (Lab)	B Selecting On Line Resources (Lab)	
2:30		Break	Break	Break	Break	Break
2:45	Registration and Check-in	A Instructional Strategies (Con't)	B (Continued) -Policy -Challenge -Censorship	B Hands-on Evaluation	E Implementing RBL Planning for Change -Networking -Strategies	
4:15		Free time				
4:30	Welcome & Introduction			Open Evening		
5:30	Social Hour	Social Hour	Social Hour	Social Hour	Social Hour	
6:30	Dinner	Dinner	Dinner	Dinner	Dinner	
7:30	Bear Pit "Issues"	Bear Pit "Meet the Ministry"	Bear Pit "Information Explosion"		Banquet & Entertainment	

Figure 1. Victoria '98 Program Timetable

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The curriculum for the inservice program was developed in consultation with the Ministry of Education, the Provincial Educational Media Association (PIMA), the B.C. Teacher-Librarians Association (BCTLA) and teachers in the field. The instructional staff and guest speakers provided leadership in the following areas:

- information technology,
- instructional design,
- resource-based learning and teaching,
- sources of learning resources, and
- the selection and evaluation of learning resources.

Figure 2 shows an outline of the major topics included in the program.

COURSE ORGANIZERS	AREAS OF EMPHASIS	RESOURCE PERSONS
A. Planning for effective resource based learning and teaching	*Rationale for Resource based learning *Instructional strategies using RBL cooperative program planning, the research model, information skills, information technology skills *The Resource/Information Network (e.g. the school library, the Internet, WWW) *Instructional Resource Packages	-Teacher librarian/Computer expert -Key instructors
B. Selecting and evaluating learning resources	*Criteria for evaluation *Sources for selection *Acquisition process *Sources of funding *Evaluation process *Selection process *Policy development *Evaluation of existing resources *Challenge *Censorship	-Ministry personnel re-evaluation -Video/Software distribution rep -BCALMER rep/Jobber -Key Instructors
C. Managing learning resources	*Providing access to learning resources *Responsibility for learning resources (staffing) *Organizing learning resources (library, cataloguing, classifying, circulating, inventorying) *Copyright *Budgeting (Funding resources) *Promoting the use of learning resources	-Teacher librarian/Computer expert -Ministry: copyright Cancopy video licenses software licenses PLN -Key instructors
D. Identifying the variety of learning resource formats	*Characteristics of print, nonprint and electronic learning resources *Strengths and weaknesses of print, non print and electronic formats *Application/Use of print, non print and electronic formats *Future developments in learning resource formats	-Non-print/electronic developers -National Film Board/CBC -Ministry/PLN -Teacher librarian/Computer expert -Book publisher/distributor -Key instructors -Author
E. Implementing resource based learning	*Planning for change *Strategies for implementation *Networking (associations, key players, etc.)	-Administrative officer -Teacher librarian/Computer expert -Key instructors

Figure 2. Course Outline

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Two hundred thirty four experienced elementary teachers from all over the province participated in the four weeks of this program. It was satisfying to receive positive and enthusiastic responses from most of the participants' informal evaluations of the program. While the impact of this program on the schools has not been assessed, according to the comments on the evaluation forms the graduates returned to their schools with a new set of values and skills that could influence the quality of instruction. The experiences gained from the immersion model could lead to fundamental changes in the way each school delivers instruction and engages learning materials as part of the learning process.

During this inservice program it was observed that few experienced practicing elementary teachers were prepared for the new technologies and that the notion of resource-based learning and teaching was not well understood, in theory or in practice. To assess the possible impact of the program on the experience of participants in the subsequent school year, a survey of all the participants was planned. The original proposal included a credit course component that was to be offered for those teachers who completed the immersion program and wished to continue. That course was offered to a small group through a distance delivery approach (WebCT) in the Spring of 1999.

The Ministry of Education, Skills and Training provided the major source of funds for the program. Of the overall program budget of $102000, the Ministry provided $90000. A modest registration fee ($50) was charged. The registration fee contributed to extras such as special events and speaker expenses. In most cases, the participant and the school districts shared costs for travel to the university. The University of Victoria provided the fare and facilities. It was originally hoped that the inservice program would be offered in future summers. That hope was not realized, as funds for special projects within the Ministry have become difficult to secure.

Team Building through Physical Challenges

Sandra L. Gibbons

The enhancement of positive self-concept has been identified as a key benefit of participation in team building programs. This paper provides a brief discussion of the impact of team building activities that include demanding physical challenges on the self-concepts of students in physical education.

Introduction

Enhancement of self-concept is widely viewed as a desirable learning outcome of physical education since it can be a powerful intervening process that may contribute to other positive changes. It is also recognized that participation in team building activities that utilize physical challenges has the potential to enhance the self-concept of students (Ebbeck & Gibbons, 1998; Gibbons & Black, 1997; Marsh, Richards, & Barnes, 1986; Marsh & Richards, 1988).

Glover and Midura (1992) utilized the concept of team building to design *Team Building through Physical Challenges (*TBPC). This program is comprised of Outward Bound-type tasks that can be readily incorporated into a physical education setting. The key for any one individual to succeed is that the entire group must master each task. Glover and Midura contend that this program can have a positive impact self-concept because as individuals master progressively harder challenges they feel better about themselves and their abilities. The authors also suggest that an individual's contribution to achieving a group goal can nurture acceptance of that person by the group.

Self Concept Development

Self-concept is defined as the "descriptions or labels that an individual attaches to him- or herself, such as physical attributes, behavioral characteristics, or emotional qualities" (Weiss, 1987, p.88). Self-concept is currently viewed by researchers as a multidimensional construct (Harter, 1988; Weiss, 1987). This construct refers to the notion that one's over-all self-concept consists of several domain-specific self-perceptions. Multidimensionality also suggests that

success at a particular activity can increase perceptions in one domain. This increase may or may not generalize to other domains. It follows that educational interventions designed to impact self-concept may be more effective if they have a specific focus on the individual domains of self-concept.

The construct of self-concept is well known in the field of education. In fact, Branden (1994) noted that teachers have been more receptive to the importance of self-concept that any other professional group. The interest in programs designed to change self-concept is understandable given the desirable outcomes associated with enhanced self-conceptions. Higher levels of self-concept are related to motivated behavior and supportive social interactions (Harter, 1987, 1993; Leary & Downs, 1995). Individuals with high, as opposed to low, self-concept are more likely to be motivated to pursue personal goals and persist in the face of obstacles. These individuals are more likely to receive support from significant others and be included in social groups. It is somewhat ironic that research has shown that teachers have not been particularly effective agents for increasing self-concept (Hattie, 1992). Hattie has suggested that typically teachers are not trained to implement programs designed to improve self-concept, and that schools need to look closely at settings in which such programs could be more effectively conducted" (p. 240).

Team Building

Team building is a term used to describe a group problem-solving task that involves the structuring of participants' interactions so that each depends on, and is accountable to, the other members of the group. Typically, participants work in groups of six to eight, on challenging tasks that require considerable organization, communication, and cooperation among the members of the group in order to successfully complete the task. An important attribute of team building tasks is the de-emphasis of competition between groups and/or individuals. Although it may be necessary to have several small groups working on a similar task at the same time, the notion of winning by virtue of being the first group to complete the task receives no emphasis or reward. Team building tasks also include pre-determined rules to be kept for the duration of the task with specified consequences when rules are broken. Finally, tasks include a range of structuring formats for participant roles and responsibilities, from those with specific pre-task assignments to others where roles and responsibilities emerge as part of the problem-solving process.

Proponents suggest that this particular teaching strategy has the potential to foster: (a) psychological support for those students who lack confidence when initiating new learning; (b) concern about welfare of group members; and (c)

sharing of individual skills and talents. Reviews and meta-analyses have found that this type of teaching strategy can be more effective than interpersonal competition or individual goal setting for producing achievement in many academic areas and positive changes in self-concept.

Team Building through Physical Challenges

Glover and Midura (1992) utilized the strategy of team building to design *Team Building through Physical Challenges* (TBPC), a sequence of 22 group problem-solving tasks in physical education that gradually increase in their physical, social/emotional, and intellectual challenge, while emphasizing a sense of adventure. The following are sample team building tasks:

Introductory task – Alphabet Balance Beam. Group members start by sitting on the balance beam in random order. The task is completed when all members are standing on the beam in alphabetical order. All members must stay on the beam during the task. If any person touches the mats or legs of the beam, the entire team must return to the original position and start anew.

Intermediate task – Bridge over the Raging River. Group members are required to travel from one end of a space (land) to the other end using assigned equipment without touching the floor (river). The task is completed when all members have crossed without touching the river with any part of their bodies and the provided equipment has been transported across the river. If a rule is broken, the group must take the bridge back to the starting line and begin anew.

Advanced task – Tarzan of the Jungle. Group members move from one vaulting box across a designated distance (swamp) to the top of a second vaulting box. The members cross the swamp with the aid of three climbing ropes. The task is completed when everyone has crossed the swamp and is standing on the second vaulting box. If any member touches the floor anywhere in the swamp or falls off the vaulting box, one member of the group who has successfully crossed the swamp and the person touching the floor must return to the starting position.

The format of the TBPC program emphasizes the following regulations: (a) specific roles for each task; (b) positive group interactions; (c) task rules be obeyed (if rules are broken, consequences must be suffered and sacrifices made); and (d) post-task reflection. Individual tasks include the following specific roles for students to perform: (a) organizer - responsible for reminding group members of the challenge, rules and sacrifices; (b) praiser - responsible

for finding specific incidents of praise by group members; (c) encourager - responsible for acknowledging efforts of group during participation; and, (d) summarizer - responsible for telling instructor how team solved a problem, and coordinating completion of team report card. Emphasis on positive interaction during team building tasks focuses on the use of positive praise phrases between teammates and attempting to decrease the use of negative interactions (put-downs). Post-task reflection is defined as a *team report card*, and is intended to serve as a mechanism for group members to reflect on the actions of the group.

According to Marsh et al. (1986,1988), it is expected that self-concepts most logically related to a particular intervention should evidence the greatest change. For example, increases in perceptions of physical ability would be predicted following a physically oriented program. Glover and Midura contend that the TBPC program provides significant physical and social challenges. Consequently, students exposed to the TBPC intervention should develop significantly higher conceptions of self-worth, athletic competence, and social acceptance. By their very nature, team-building tasks also require participants to brainstorm, experiment, and communicate toward finding solutions to challenging problems. One would expect that these actions associated with problem solving combined with the eventual successful completion of the challenges are likely to contribute to increased self-perceptions of scholastic competence.

Research on Team Building in Physical Education

Outdoor education has been the primary setting for the majority of research on team building activities using physical challenges. Specifically, team-building tasks have been utilized in Outward Bound programs to meet a variety of outcomes, including enhancement of participant self-concepts. Outward Bound courses include physical and intellectual activities designed to help participants recognize their strengths and limitations. Marsh, Richards, and Barnes (1986) reported significant increases in multiple dimensions of self-concept for a group of young adults (N=361) who participated in a 26-day Outward Bound program. Of particular note in this study was the improvement in dimensions of self-concept specifically related to the explicit goals of the Outward Bound program. For example, variables such as honesty, general-self, and physical ability showed notably more improvement than variables such as academic ability and mathematical ability, which are less related to program goals. These results provide support for the notion of domain-specific self-concept and the design of an intervention that focuses on particular aspects of self-concept. In a similar study, Marsh and Richards (1988) examined the effects of participation in a six-week Outward Bound program on the academic achievement and self-

concept of a group of low achieving ninth grade males (*N*=66). The data showed significant improvement in the aspects of academic self-concept and achievement emphasized as part of this project. The results from these studies provide further support for the need for specific rather than general intervention strategies in order to achieve particular outcomes.

Several researchers have examined the use of team building activities in the physical education class setting. Langsner and Anderson (1987) investigated the impact of an outdoor challenge program in physical education on self-esteem and locus of control of boys (N=31), aged nine to thirteen. The members of the experimental group (n=14) participated in a 14-week program entitled Project Explore which followed seven sequential stages including goal setting, awareness, cooperative activities, trust, individual initiative tasks, group initiative tasks, and adventure activities. No significant treatment effects on either dependent variable between the experimental group and control group were found. The authors noted that any interpretation or generalization of these results must be tempered by the study's small sample size.

Two recent studies have specifically examined the effects of the TBPC program on self-concepts of physical education students. Gibbons & Black (1997) examined the effectiveness of the TBPC program on the self-concepts of male and female middle school students in a coeducational physical education setting. Results indicated significant pre- to posttest increases for members of the experimental groups on four of the six variables (global self-worth, social acceptance, athletic competence, behavioral conduct) following a 7-month intervention. In addition, boys reported significantly higher perceptions of athletic competence and global self-worth than girls. Ebbeck & Gibbons (1998) used a similar design with sixth and seventh grade students in coeducational elementary school physical education. One research question focused on whether gender differences would be found with younger students. Similar gender differences were found.

Current Research

A current research project in progress extends the parameters set by Ebbeck & Gibbons, 1998; and Gibbons & Black, 1997 by attempting to tease out more information on the gender differences found in these studies. The purpose of this current project is to investigate the effectiveness of the TBPC program on the self-concepts (global self-worth, athletic competence, physical appearance, social acceptance, scholastic competence, and behavioral conduct) of female physical education students in grades eight and nine. The researchers in the two previous studies implemented the TBPC program in co-educational physical education classes. Given the documented gender differences across

self-concepts in these studies, it was decided in this project to implement the intervention in an all-female physical education class. The results will provide insight into the possible impact of the TBPC program on self-concepts of female students, without the presence of male students as a possible intervening factor.

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Studying Intramuscular Metabolism in Children: Technology and Ethics

Catherine A. Gaul

While muscle metabolism is well characterized in adults, there exists a lack of ethically acceptable methodology to measure various characteristics and events in muscle of children. The development of non-invasive means of studying human tissue will provide a strong potential for being able to clarify how skeletal muscle metabolism develops and will allow for the study of muscle bioenergetics in children.

In adults, regular physical activity has been demonstrated to improve central (cardiorespiratory) and peripheral (muscular) physiological systems, leading to enhanced function and the optimization of health. However, in children, while cardiorespiratory variables have been well investigated, metabolic activity in muscle is not as easily studied. Consequently, there is a lack of understanding regarding the various metabolic systems available for energy production in children, particularly that of anaerobic metabolism. Up until recently most methodologies available to evaluate metabolism in muscle have involved invasive, difficult procedures effectively limiting the ability to study this aspect of human physiology. The application of these adult-oriented procedures to the study of children can be difficult and ethically inappropriate. The following is a brief review of the methodologies typically used in the assessment of intramuscular metabolism and the limitations to their use with pediatric populations. Included is a description of new technology that offers exciting possibilities for studying muscle bioenergetics in children.

Evaluation of Metabolic Systems

The aerobic and anaerobic metabolic systems are the primary energy generating processes in human skeletal muscle. Aerobic metabolic activity is often measured by collecting and analyzing expired air from a resting or exercising individual. This methodology indirectly evaluates the effectiveness of oxygen transport by the cardiovascular and respiratory systems, and oxygen utilization

by the working musculature. Of the two energy systems, the aerobic system is more easily evaluated, due to its close relationship to the respiratory system and the relative ease of measuring gas concentrations in collected expired air.

Anaerobic metabolism does not lend itself as easily to evaluation. Performance measures involving high intensity, short duration, explosive type cycling or running exercises are commonly used as a means of indirectly evaluating anaerobic metabolic capabilities. A limitation to this type of measurement is that it cannot be used to assess the anaerobic contribution to energy metabolism during low intensity activities, nor can it be used to characterize anaerobic metabolic developmental status. The processes involved in anaerobic metabolism are more independent of any other physiological system than aerobic metabolic processes. Consequently, in order to study anaerobic characteristics of muscle, it is often necessary to employ invasive and technically difficult methodologies including muscle biopsy or blood sampling.

Traditional Assessment Methods

Performance testing

Indirect methods, such as those involving physical performance tests, are commonly used in the evaluation of intramuscular metabolism. These tests typically involve running or cycling for a duration and intensity consistent with the metabolic system of interest. Aerobic tests normally consist of either long duration performances or progressive increments in work intensity to exhaustion. Results are assumed to reflect a combination of central and peripheral system involvement for the evaluation of cardiorespiratory and metabolic status. Anaerobic tests involve very high intensity work of short durations ranging from 1-30 seconds. As cardiorespiratory variables do not limit such performances, test results are assumed to reflect metabolic status in the working skeletal muscle (Bar-Or, 1987). Motor control plays an important role in performance of these tests. As such, interpretation of test results must be made with caution as they can be influenced not only by metabolic processes, but also by ineffective or inappropriate motor unit recruitment, as well as other neuromuscular limitations.

Muscle biopsy

A common method of measuring intramuscular enzymes, substrate concentrations, cellular adaptations and tissue alterations involves the removal of a small sample of skeletal muscle tissue from the subject. Muscle biopsy techniques have been used extensively in the study of adult muscle. The removal of a sample of muscle tissue involves some type of localized anesthetic, a small scalpel slice through the skin and underlying connective tissue and a

biopsy needle to puncture the muscle surface and harvest a sample of muscle tissue from areas deep to the incision. Often, serial biopsies from the same incision site are taken during a testing session to assess acute changes over the test period. Incisions and biopsy sites can usually be closed using sterilized adhesive strips. The tissue samples are frozen in liquid nitrogen immediately upon removal and stored for subsequent processing and analysis of various metabolic markers and tissue characteristics.

Blood Analysis

Metabolic by-products are cleared from their production site in skeletal muscle by local blood flow. As a result, blood concentrations of these metabolites can be used to reflect the activity and status of the metabolic systems. An example of such a metabolite is lactic acid, a metabolic by-product of incomplete oxidation of carbohydrate. The accumulation of lactate (the salt of lactic acid) in muscle, has an inhibiting effect on glycolytic enzymes and is one of several factors related to fatigue during strenuous exercise. While it is possible to measure muscle lactate via biopsy, it is more commonly measured in blood. However, the relationship between production of this metabolite in muscle and its level in blood is complicated by the fact that lactate can be metabolized during the clearing process. This can result in blood lactate concentrations that may not accurately reflect the rate of lactate production by the working skeletal muscle (Stainsby & Brooks, 1990). An additional difficulty is the timing of blood samples relative to the assumed time of peak lactate production. If a blood sample is taken too early, blood lactate levels may not reflect the concentration in muscle due to lack of clearance time from muscle. On the other hand, if the sample is taken too late, the lactate may been metabolized either at the level of skeletal muscle or at the liver, again resulting in lower than expected values. The timing of blood sampling is obviously an important aspect of this methodology. As a result, many studies utilizing this procedure incorporate serial blood sampling in an attempt to ensure true 'peak' lactate levels are measured.

Measurement of Skeletal Muscle Metabolism in Children

It has been suggested that the processes of growth, development and physical maturation are influenced by physical activity during childhood and adolescence via modulation at the cellular level (Cooper, 1994). Methodological constraints have limited our understanding of the development of metabolic systems, the mechanisms involved in exercise-induced changes in physiologic function in children, and the long term effects of activity during childhood. Muscle metabolism, both at rest and during exercise in children, has traditionally been limited to gas analysis procedures or performance of some type of aerobic or anaerobic work. These methods provide a means of evaluating aerobic and

anaerobic metabolism through the measurement of oxygen consumption, force generation or work performed. While useful in their ability to identify the power and capacity of the metabolic systems, these non-invasive methods do little to describe localized intramuscular metabolic alterations that occur during development or exercise. As a result, few data exist to describe the intramuscular environment in children.

The present understanding of skeletal muscle metabolism in children is based almost exclusively on series of muscle biopsy studies conducted in the early 1970s on a small sample (N=8) of 11 to 15 year old boys (Eriksson, Karlsson & Saltin, 1971; Eriksson, Gollnick & Saltin, 1973; Eriksson & Saltin, 1974). The concept that muscle metabolism, and particularly glycolytic enzyme activity, could be related to physical maturation emerged from the findings of this work. However, the limitations to the research designs of these studies led the investigators to caution against attempting to draw general conclusions about the metabolic characteristics of children. Other studies using biopsy methods have been unable to repeat the results of these early studies (Berg, Kim & Keul, 1986; Haralambie, 1982). Nevertheless, the findings of Eriksson and colleagues have been so regularly cited that attenuated glycolytic metabolism in children has become an accepted paradigm in the pediatric literature. Ethical considerations have restricted the use of the very invasive muscle biopsy technique in children limiting the number of studies and publications that employ this direct measure of skeletal muscle in children. Consequently, recent pediatric muscle studies have been limited to using indirect performance measures or blood lactate to study metabolism in children.

With very few exceptions, maximal blood lactates have been reported to be lower in children than in adults (Pfitzinger & Freedson, 1997). These findings have been used to support the concept that glycolytic metabolism is limited in children. Similar to the available literature on muscle biopsies, low lactate concentrations have become expected, regardless of findings by others indicating that high maximal blood lactates do occur in children (Cumming, Hastman, McCort, & McCullough, 1980). There are a number of possible explanations for the low blood lactate concentrations reported in this population. Large blood volumes relative to body size, typical of children, could produce a diluting effect on blood lactate. The high hepatic blood flow and lower sympathetic activity in children relative to adults may result in greater ability to remove lactate from muscle indicating that adult-oriented blood sample timing would be inappropriate. As a result, serial blood sampling would be the only manner in which maximal blood lactate values could be assessed. Ethical constraints limit the use of such research design with children. Moreover, intensities less than maximal would not be expected to produce high lactate levels, yet often studies reporting maximal blood lactate levels have only included submaximal intensities.

New Technologies for Measuring Metabolism

Recently, Phosphorus Nuclear Magnetic Resonance Spectroscopy (^{31}P-MRS) has been employed in exercise science research as a powerful, non-invasive method of evaluating biochemical activity *in vivo* (McCann, Mole, & Caton, 1995; McCully, Vandenborne, DeMeirleir, Posner, & Leigh, 1992). ^{31}P-MRS allows for quantitative recognition of many metabolites, such as phosphorus (^{31}P), using spectroscopic analysis, thus providing a mean of studying tissue metabolism non-invasively yet *in vivo*. Phosphorus is intimately involved in muscle bioenergetics since the energy stored in the Phosphorus-Oxygen bonds of ATP is used to drive cellular metabolism. As the only source of energy for metabolism is from degrading and resynthesizing these compounds, ^{31}P-MRS is a powerful tool for studying metabolic activity in the same sample of tissue repeatedly under a variety of conditions.

In brief, ^{31}P-MRS involves a transceiver coil tuned for the ^{31}P radiofrequency. The coil is positioned onto the surface of the muscle to be studied and the subject is placed in a high magnetic field of a large bore magnet. The radiosignal (spectra) returning to the coil from the tissue being studied can then be processed and analyzed to calculate Pi (intramuscular phosphorus), phosphocreatine (PCr), and pH from the tissue being studied.

The non-invasiveness of this technology, and the ability to measure metabolism in 'real time' allows the researcher the ability to address some of the outstanding questions in pediatric physiology. This technology offers an ethically acceptable and reliable means of studying muscle metabolism in children at rest, during exercise and in recovery from exercise (Cooper & Barstow, 1996).

To date the application of ^{31}P-MRS in pediatric research has been limited to a few studies (Zanconato, Buchthal, Barstow, & Cooper, 1993; Kuno et al., 1995; Petersen, Gaul, Stanton, & Hanstock, 1997; Taylor, Kemp, Thompson, & Radda, 1997). While this new technology is quickly becoming accepted as the most effective means of measuring intramuscular aerobic and anaerobic metabolism in both adults and children, the expense of the procedures involved in ^{31}P-MRS research remains a severe limitation.

Summary

With the advent of accurate, reliable, non-invasive technology, effective investigation of intramuscular activity in children is becoming possible. Such technological advances will greatly enhance our knowledge not only of how immature systems respond to acute and chronic activity, but also of the natural

processes of muscle growth and development. In turn, its applicability to the study of chronically sick children, and children experiencing metabolic disorders (such as diabetes, muscular dystrophy, and cystic fibrosis) will greatly enhance the understanding of metabolic implications of illness and disease. The findings of studies utilizing this technology will have important implications for developing effective health and rehabilitative for all children.

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The Effect of Instruction on Children's Knowledge of Marine Ecology, Attitudes Towards the Ocean, and Stances Toward Marine Resource Issues

Shirley Cummins and Gloria Snively

This study examined Grade 4 students' knowledge of marine ecology, their attitude towards the seashore and ocean, and their stances (preservationist, conservationist, exploitive) towards marine resource issues before and after a classroom instructional unit. The results of the research have implications and recommendations for future research as well as for curricular development and program planning regarding environmental education in general and marine studies in particular.

Rationale

Humankind is faced with a multitude of ecological crises. We now know that harmful impacts from human activities can be found in virtually every corner of the ocean, from polluted bays to the remote deep sea. Basic needs for a growing population, consumption patterns in the developed world, and our own technology led us to reach the limit of world fish catch nearly a decade ago. Our harvest has reached such a massive scale that scientists now believe we are affecting entire ocean food chains.

In classroom discussions, young children use words such as pollution, ozone layer, green house effect, and endangered species; and are aware of topics such as local oil spills and pollution from pulp mills and fish farms. Although students are aware of many environmental issues and concepts, their knowledge of marine ecology concepts and marine resource issues is low (Brody & Koch, 1989; Snively & Sheppy, 1991).

A study by Snively and Sheppy (1991) generated data on students' knowledge of marine ecology and opinions towards natural resource issues. Questionnaires, which addressed student knowledge and opinions, were developed and administered to Grade 5 and Grade 9 students in three communities in British Columbia (Victoria, Campbell River, and Williams Lake). These students demonstrated limited knowledge of science as it applied to the

ocean and of the ways in which humans utilize the resources of the ocean. However, the students' opinions towards marine resource issues were predominately preservationist or strongly conservationist, which indicated positive student attitudes towards the seashore and ocean. From the results of their study, Snively and Sheppy advocated the identification of students' beliefs and opinions as an important way educators could monitor and resolve conflicts that may exist between students' beliefs prior to instruction and the concepts that are taught in the classroom.

Purpose of the Study

Cummins (1997) developed a marine science unit of explicit instruction from a constructivist perspective. In an attempt to expand on the Snively and Sheppy study, Cummins (1997) was interested in examining the effects of her teaching unit on the knowledge, attitudes and opinions of her grade 4 students. For the purposes of this study, an attitude was defined as a favourable or unfavourable feeling towards objects, persons, groups or any other identifiable aspects of the ocean and seashore environment (Koballa, 1988). Knowledge was defined as scientific information that these students possess in the areas of physical oceanography, ocean ecology, and human effects on the ocean (Snively & Sheppy, 1991). Stances were defined as the opinions that these grade 4 students had towards a variety of coastal marine issues and represented an appropriate course of action to take in a given resource conflict situation, including conservationist, exploitive or preservationist (Snively & Sheppy, 1991). Cummins (1997) used the Snively and Sheppy questionnaires to assess the development of students' knowledge of seashore and ocean ecology, their possible changes in attitude, and what opinions they had about a variety of marine resource issues before and after that instruction.

Research Questions

The research questions that formed the basis of this study were:

1. What is the nature of the children's attitudes towards seashore ecology before and after experiential learning?
2. What is the nature of the children's knowledge of seashore ecology (tides and currents, habitats, food chains, seashore communities, and related marine issues) prior to and after instruction?
3. What are the children's stances (conservationist, preservationist, or exploitive) towards a variety of marine issues prior to and after instruction?

4. Will an increase in the knowledge of beach ecology have an effect on the children's attitudes and stances?
5. How effective was the strategy of instruction?

Participants and Measures

This study involved one class (N=26) of grade four students at Lampson St. School in Esquimalt, British Columbia. Located on the southern tip of Vancouver Island, the school is within walking distance of a beach. Four questionnaires developed for grades 5 and 9 students and described by Snively and Sheppy (1991) were used to collect the data in this study. Cummins (1997) modified two of the questionnaires to make them more appropriate for grade four students.

Ocean Background contains 25 items which include questions about the frequency of students' visits to the seashore, the preferences for studying the seashore or ocean environment, their frequency of their use of the ocean for a variety of activities, and the frequency in which they engaged in learning experiences which were ocean-related.

Ocean Attitudes is a 37-item questionnaire designed to assess students' attitudes towards the ocean. Five choices are given for responses ranging from strongly disagree to strongly agree. The topics cover a variety of specific coastal issues such as wild marine mammals in captivity, removing seashells from beaches, and the commercial fishing industry.

Ocean Life is a 30-item multiple-choice questionnaire designed to assess students' scientific knowledge of the ocean and coastline. It consists of three sub-tests; Physical Oceanography, Ocean Ecology, and Human Effects on the Ocean Environment.

Ocean Opinions is a 20 item multiple choice questionnaire in which students are asked to choose from among four options the one which best matches their opinion as to an appropriate course of action to take in a given resource conflict situation. Exploitive Stance options were written to express the point of view that immediate economic return is the prime concern in human interaction with the environment. Conservationist Stance options recognize that Canadian society depends upon the utilization of nature's resources to meet its needs and desires, but that the resources must be used carefully in order to prevent their depletion or extinction so they are maintained into the future. Preservationist Stance options were written to reflect the attitude that humans should interfere minimally or not at all with natural processes, that economic considerations should never be a factor in decision making or that humans

should seek to restore the environment to some "natural" condition. The following is an example of the sort of item used:

> *Some species of whales are <u>not</u> near extinction. What should be done about hunting these kinds of whales?*
>
> *A. Hunting whales should be allowed because it provides people with food, clothing and money.*
>
> *B. Hunting whales should not be allowed because whales are beautiful and intelligent.*
>
> *C. It is all right to kill a certain number of these kinds of whales as long as plenty are left.*
>
> *D. Hunting whales should not be allowed because whales are part of the food chain.*

Item A represents the Exploitive stance, Item C the Conservationist stance, and Items B and D represent the Preservationist stance. Responses were calculated so that each student received a separate score for each stance.

Instructional Strategies

A constructivist view of learning guided the development of the unit on marine ecology as well as the instructional strategies for this study. The first field trip site was within walking distance for the children involved, thus providing an opportunity for repeated visits. The beach has a small sandy area and a rocky shore containing many tide pools wherein many marine plants and animals can be viewed in their natural habitats. The other site was the Cowichan Bay Marine Ecology Station where the children were given further opportunity to explore the characteristics of living marine animals and plants using microscopes, in aquaria, on real time video, and through plankton collecting excursions.

Classroom instruction was designed to develop the marine science concepts: (1) ocean currents, waves and tides, (2) seashore zonation, (3) predator/prey relationships, (4) food chains, (5) interdependence, and (6) stewardship. The issue of Pacific salmon stalk depletion was developed and related to the scientific knowledge emphasized in this study. In addition, the issue was explored from many viewpoints (conservationist, commercial fishermen, biologist, government official, First Nations chief) and analyzed in depth using a role-play strategy. Although the issue was explored from many viewpoints, the instruction encouraged a conservationist's view as the appropriate stance to adopt in attempting to resolve the B.C. salmon issue. The choice of this view was based upon the belief that the salmon resource can be utilized as a food

source for humans and at the same time be managed wisely to ensure viable salmon stocks for future generations.

The Findings

Paired sample t-tests were used to compare pre and post data on the Ocean Life, Ocean Attitude and the Ocean Opinions questionnaires. Pearson product-moment coefficients were calculated to search for correlations among attitudes, knowledge and stances. The students' field logs as well as the researcher's journal were consulted to clarify findings and assist with data interpretation.

Ocean Attitudes. The responses for each student were tallied from using a 0 to 4 coding, wherein 0 was considered very positive and 4 very negative. An attitudinal score was then assigned to each student by subtracting the negative responses (3 and 4) from the positive responses (0 and 1). The higher the score, the more positive the attitude. All number 2 responses were considered neutral and not used to determine the attitudinal score for each student. A paired sample t-test was then administered to the pre-attitude and post-attitude scores. The results indicated a significant increase in attitude. The students (>90%) remained very positive (0 and 1 values combined) in their attitudes towards the statements on the post-instructional Ocean Attitudes questionnaire concerning pollution (pulp mills, Victoria's sewage disposal, damage to wetlands) and the treatment of marine mammals (harp seals being hunted for their fur, whales in captivity, seals being shot by salmon fishermen). Also, in 91% of their responses the children indicated that they thought all living things had a right to exist. The same percentage of students agreed that stronger laws are needed to protect our ocean, seashore and wetlands. Other positive responses (>74% of the responses) included disagreeing with marshlands being filled in and the exploitation of natural resource. Most of the students agreed that commercial fishermen take too many fish (87%), and the taking of shellfish should be restricted (87%). Certain items illustrated the increase in positive student responses in the posttest questionnaire as compared to the pretest questionnaire very clearly.

Ocean Knowledge. The post-instructional knowledge scores from the Ocean Life questionnaire were compared to the pre-instructional knowledge scores by administering a paired sample t-test to determine the level of significance. Significant increases in correct student responses were evident for the items that were directly related to the concepts covered in the instructional unit.

Ocean Opinions. Exploitive stances remained very low (>5%) on all items except one and most responses remained Conservationist or Preservationist.

Although the posttest percentages of responses remained close to the pretest responses, the major differences appeared not in the student percentages for each stance but in the variety of stances each student chose for the total number of items on the questionnaire. In other words, fewer students were strictly preservationist or conservationist but a mixture of these two stances. As well, there were two students whose 20 responses were evenly distributed among the preservationist, conservationist, and exploitive stances. This was interpreted as meaning that the students were trying to approach these issues from many different perspectives and perhaps less than idealistic in their thinking. Students remained the same in some of the stronger preservationist stances that were evident in the pre-instructional questionnaire. Some of the post-instructional responses showed an increase in preservationist opinions.

When viewing the stance differences between gender, the girls remained more preservationist than the boys. Out of 460 responses, only 30 were exploitive (M=22, F=8).

Conclusions

The very fact that there was a significant increase in attitude appeared to indicate a connection to the instructional strategies used to provide the students with the firsthand experiences and concepts necessary to develop an understanding of the seashore community and the impact of human intervention. Closer scrutiny of the responses to the pre-instructional and post-instructional attitude questionnaires revealed that the items showing the most increase in positive scores were ones that could be linked to first hand concepts covered during the course of instruction. The increase in attitude scores may indicate that attitude is an indicator of surface thinking and more easily changed than stances, which may be more deep-set conceptual structures.

A closer examination of individual student responses and how they changed in stance revealed some interesting trends. Only 5 students remained strongly preservationist out of the 9 whose responses had indicated that stance in the pretest. The movement of scores was towards a more conservationist stance thus less polarized. These patterns could be a result of the students viewing the resolution of marine resource issues as a complicated process involving tolerance of many opinions and critical evaluation of consequences. Perhaps, the many perspectives presented in the role play activity concerning the decline in the Pacific salmon stocks assisted students to examine their thinking on other resource issues.

The researchers concluded that the instruments used in this study did help in assessing the effectiveness of instruction. The knowledge of how students think and believe the way they do is certainly worth investigation and will assist educators to develop curricula that will meet the needs of students with different beliefs, opinions, and levels of understanding. As well, it would seem likely that issue instruction could lead to active citizenship roles, the ultimate goal of environmental education.

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Recent Canadian Contributions to Adult Literacy Policy and Practice in Tanzania

Adrian Blunt

Literacy work in Tanzania over the last three decades has been influenced by major economic and political changes as the country shifted from a newly independent, one party, socialist state seeking self-reliance, to a multi-party, capitalist state seeking participation in the new global economy. The paper describes and analyzes the contexts for adult literacy education since the country's independence and a Canadian International Development Agency (CIDA) funded project to sustain adult literacy. Implications for adult literacy education in least developed countries are identified.

Introduction and Background

A recent *Guardian Weekly* article informed readers that, as a consequence of the International Monetary Fund's (IMF) requirement that Tanzania introduce education fees to reduce its budget deficit, elementary and secondary education will no longer be free and that schooling will soon become, "a luxury not all can afford" (Denny, 1999). This pronouncement heralds a grim future for the country's rural poor, many of whom are currently unable to read a newspaper, if they could afford to buy one. An increase in the numbers of children who withdraw early from, or never attend, elementary and secondary school will inevitably result in increases in the numbers of undereducated, low-literate and illiterate adults over the next decade. Adult illiteracy in Tanzania is also currently a cause for concern as the literacy achievements acquired through early mass national campaigns are not being sustained. Together these occurrences will further limit the population's development prospects, particularly among the rural poor who comprise the majority of the population.

Following independence in 1962, under the Presidency of Julius Nyerere, an ex-teacher, the Republic of Tanzania became committed, to a greater degree than any other emerging nation, to adult education and literacy as instruments of development. Nyerere was widely recognized for his conceptualization of the role of education in development (See Nyerere, 1973). Western observers

acclaimed as enlightened and progressive, government policies to eradicate poverty through lifelong education, which with *Ujamaa,* Tanzania's model of democratic socialism, would restructure the economy and achieve self-reliance. However, over the last three decades the picture has changed from a socialist, utopian vision of self-reliance, social justice and the eradication of poverty to a global market nightmare of dependency, social injustice and grinding poverty.

Although Nyerere's vision was referred to earlier as utopian, education planners and their international consultants were not naive about their prospects for success. They recognized that Tanzania's educational reforms and development strategies were dependent upon external and internal factors over which they had little or no control and they anticipated that it would be of the highest importance

> ...that the integrated institutions for education at the grassroots level ... really become institutions of the masses, where the people will identify their educational needs ... and create their lifelong education for a self-reliant and liberated development. Major problems confronting the political, economic and social development of Tanzania may have further repercussions ... since past and present history show that education in Tanzania is inevitably affected by the objectives and realities of overall national and international development. (Hinzen & Hundsdorfer 1979, p. 15)

Research Questions

In this paper two questions are addressed. First, what occurred in Tanzania's development history to prevent universal adult literacy from being achieved and sustained? Some of the macro-level events that have shaped development in Tanzania are briefly described. However, no attempt is made to provide a comprehensive explanation for the failure of policies and programs, which requires an analysis of, including among many other factors, the debilitating effects of corruption and mismanagement, high interest payments, the failure of international socialism, and the negative effects of *Ujamaa.* Only the broad economic and political contexts for development within which the Ministry of Education and Culture (MEC) managed its adult education and literacy programs are considered. Secondly, what has been Canada's recent experience in contributing to Tanzania's adult literacy programs and practice? In response to this framing question a Canadian International Development Agency (CIDA) project and its outcomes are described.

Tanzanian Education Concepts and Development Periods

Buchert (1997) has identified four core concepts which have influenced education planning in Tanzania: human capital development; human development; human capacity development; and human resources development. Aspects of these four conceptual schema have been reflected in planning at different times, with different emphases. Buchert makes it clear that a linear transition over time, from one conceptualization to the next, has not occurred. Drawing on MEC sources and Buchert's concepts however, it is possible to identify a historical shift in development contexts and conceptualizations, that is influenced by the emergence of the global economy which, over three decades, has shaped Tanzania's adult education and literacy policies.
Human Capacity Development (Early 1960s - 1970s)

From the early days of independence, the purpose of education in Tanzania was to eliminate poverty and achieve social change. Through lifelong education, political consciousness would be developed at all levels of society; national goals and priorities communicated; a consensus on priorities sought; a sense of national development fostered; and personal and community commitments to development, promoted and sustained. Adult education was to be innovative, free, serve community interests, and centrally directed in support of integrated multi-sectoral development strategies. Mass national literacy campaigns were to trigger local development and the attainment of social justice and equity goals. Tanzania's long term goals were economic self-reliance and political non-alignment. *Human Resources Development (Late 1970s to 1980s)*

Support for poverty reduction and sustainable development became priorities for education during this period. International aid was reduced to African countries and the decline of international socialism eliminated prospects for aid from non-western sources. The economic priorities were to increase cash crop and raw materials exports and maintain revenues to support social welfare spending and a stable democracy. Adult education continued to enhance community capacity although entrepreneurism was now a priority. Basic education for children and youth was a priority rather than adult and lifelong education. Mass literacy campaigns funded by international donors continued. Social equity priorities, including the education of females, were acknowledged although resources permitted little investment in this area. *Human Capital Development (Late 1980s to 1990s)*

Today, Tanzanian education is focused on supporting economic growth and capital accumulation. Planning and management has been devolved to the regional level and allows for the return of non-government organizations (NGO) into the non-formal education sector. Local authorities must rely on their own

tax base and other resources to pay for literacy programs. Lifelong education is no longer a priority and adult vocational education rather than literacy, and entrepreneurism rather than community enterprise are now priorities. User fees are charged for education and health services and poverty elimination is no longer identified as a goal, except in political rhetoric.

Factors Contributing to Development Failure

One global phenomenon has emerged to prevent least developed countries from managing their own development and to challenge the priorities of public education in every country, that is the new global economy and its attendant institutions including, transnational corporations, and the International Monetary Fund (IMF), World Bank (WB) and World Trade Organization (WTO). While Tanzania has maintained peace and stability during its transition from a one party socialist state to a multi-party, capitalist state, the government has had no success in achieving economic and political self-reliance. Tanzania's new colonizers are international bankers, economists and trade bureaucrats who dictate the country's economic and social policies for the benefit of the global market. Literacy education under the effects of globalization has shifted from a national, emancipatory and liberatory practice to a local, technical-rational practice focused on serving the immediate needs of the individual, the economy and employers to the virtual exclusion of community social goals and development priorities.

Current Context for Adult Literacy Education

There are no funds for a national program although professional staff at the national, regional and district levels have been maintained. Program funds must now come from international donors, regional budgets, or NGO. Because, national literacy campaigns failed to contribute to economic development as anticipated; rural libraries are not maintained; and materials to sustain adult literacy are either unaffordable or unavailable. International donors unimpressed by their experiences have shifted their funding priorities to elementary and vocational technical education, and to strengthening civil society. The IMF and WB now require the government to implement user fees for public education and there is little or no support at the local level for the allocation of resources to adult literacy programs.

While national literacy programming has been halted, the MEC has sought, and received, assistance from donors to develop new program approaches within a newly conceptualized "Integrated Community Based Adult Education (ICBAE)

Expansion Project". ICBAE is a radical change from the traditional Tanzanian approach. It is a "bottom-up", rather than "top-down" model, with planning, implementation and evaluation functions all devolved to the regional and district levels. The new approach emerged from MEC's recognition that: its national and regional planners had inadequate knowledge of the learning needs and interests of villagers; staff had little useful knowledge of community based programming; there was a lack of knowledge and skills among local facilitators and literacy trainers to respond to local needs; and rates of adult functional illiteracy were increasing.

The Sustaining Literacy Project

The Saskatchewan Institute for Applied Science and Technology (SIAST) was selected to design and implement a project to sustain adult literacy, based on its experience with literacy education and prior international experience with community-based development. Working with a national advisory committee, project consultants outlined the principles for an ICBAE project and two village sites were selected. The literacy approach selected was the REFLECT model developed by ACTIONAID, a UK international development NGO.

The REFLECT approach (Archer & Cottingham, 1996) incorporates the philosophy of Freire (1970) with Participatory Rural Appraisal (Chambers, 1992), a variant of participatory research methodology. Facilitators work with villagers to form literacy circles of 10 to 20 persons. Circle participants meet to study development issues by constructing maps, matrices, calendars and other graphic representations of villagers' lives. Available items, such as, pebbles, nuts, straw, beans and sticks are used to represent concepts under discussion, such as, crops, locations, or illnesses. Drawings on the ground are also made and when the graphics are completed they are copied on to large sheets of paper using charcoal or crayons. The vocabulary for the concepts is taught phonetically and circle participants create a text from their graphics. At this stage participants are provided with pencils and paper to produce their own copies of the graphics. Motivation is sustained as the circle members control the process by selecting the facilitator, identifying the development issues, and making decisions for future action. Through compiling local knowledge and understandings participants develop a capacity to act together, they "write and read" their own development agenda and become functionally literate in a context which makes most sense to them, the development of their own community.

A small revolving fund was established to enable participants to access micro-capital. For example, a small group of women from one circle decided to make

school uniforms to sell to other families. They created their own "literacy of sewing circle" and with the assistance of the facilitator found a local tailor willing to teach garment making. The tailor was paid from the ICBAE budget to teach the literacy of pattern making, materials estimating and machine sewing. A local accountant taught the group basic bookkeeping and business planning. The women applied, in writing, for a loan to purchase one sewing machine. After learning from the salesperson how to read the sewing machine manual they co-signed for their loan at an agreed rate of interest and repayment schedule. By using their machine in shifts and selling the uniforms to neighbors they repaid the loan promptly and applied for another to purchase a second machine. Eventually each woman owned her own sewing machine and while they continued to purchase materials cooperatively and to meet as a social group, each worked at her new business independently. Through a similar process one group of men formed a "literacy of furniture-making circle" and another circle established a non-profit community pharmacy.

Project Outcomes

After three years the project evaluation demonstrated: a high rate of retention among learning circle participants, participants appreciably improved their levels of functional literacy, and a number of small livelihood and community development projects had been started successfully. Participants recommended their circles to others and additional community requests exceeded the capacity of the project to respond. Initial resistance to ICBAE within the MEC declined and at the conclusion of the project support for the model was voiced by district staff responsible for its administration. In 1997 the MEC established ICBAE literacy as a ministry program enabling it to be adopted by the autonomous regions, and in 1998 donor funding from the African Development Bank (ADB), extended the program to approximately 200 communities. In 1998 ACTIONAID opened an office in Tanzania with support being provided by MEC.

Implications for Adult Literacy Education

National development goals and contexts have shifted in Tanzania, as they have in other countries, with major implications for literacy education. Through devolution of authority to the regional level, planners now have the opportunity to develop programs that are responsive to community interests. With the ICBAE model of literacy there exists the opportunity, depending on the choices communities make, for literacy education to be responsive to human capacity, and/or human capital development goals. Through the ICBAE model,

communities can link literacy education with their development priorities and increase their control over, and participation in, development. Further, space is created by devolution for NGOs to re-enter the adult education sector and offer an alternative literacy education, a literacy for human scale development (Max-Neef, 1991). Finally, this recent Canadian experience in Tanzania confirms prior development experience (Blunt & Barnhardt, 1995) that macro-level, nationally managed projects for social or economic development are less likely to be successful than locally managed, small scale, participatory development projects.

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[2] The factors contributing to the failure of development are not unique to Tanzania, they are contributing factors, to a greater or lesser extent, in all of the countries comprising the Southern African region.

[3] The Swedish International Development Agency (SIDA) and the Cananadian International Development Agency (CIDA).

[4] Cypress Hills Regional College was a supporting Canadian Partner seeking experience in international development.

[5] The name REFLECT was originally an acronym for **R**egenerated **F**reirean **L**iteracy through **E**mpowering **C**ommunity **T**echniques. ACTIONAID no longer uses, and requests others not to refer to, REFLECT as an acronym.

Teacher Knowledge and the Evaluation of Student Achievement

John Anderson, Faye Stefan and Lucinda (Cindy) Brown[1]

The study continues a series of investigations into the procedures and information bases pre-service teachers use in making judgements about student achievement. These studies have attempted to investigate how teachers go about evaluating the achievement of their students. The investigations use both qualitative and quantitative data in an exploratory approach.

What teachers know and how they know it seems, on the surface, to be an area readily accessible to investigation and the answers should largely be in place. However, this is not the case. The study of teacher knowledge is plagued by at least two fundamental problems: proximity and situational complexity. To an extent most people know something about teacher knowledge, having been exposed to teachers and teaching for over a dozen years of formal schooling. Most readers of papers such as this (who would be university researchers) have a closer association with teacher knowledge in that they have a store of their own teacher knowledge, having been an educators most of their adult (post-schooling) life. This proximity can be viewed as a fundamental problem in investigating any aspect of education and teacher knowledge in particular. University researchers are simply too close to the phenomena to clearly view it in others and if we do consider teacher knowledge as a distinct entity we are likely to assume that we more or less know what it is and how it works. This can distort the meanings of what we do choose to see and hear. A compounding problem is the nature of teacher (or any human) knowledge – it is dynamic, complex and situationally specific. In other words the phenomenon of teacher knowledge has not generally been well studied. However, over the past decade or more there has been considerable work completed on researching teacher knowledge as evidenced in major reviews such as those of Grimmett and MacKinnon (1992) and Fenstermacher (1994).

Teacher knowledge as a distinct field of study has roots in the realization that the knowledge discovered and developed by university researchers could be considered privileged knowledge, or at least distinct from the knowledge teachers use and develop in classrooms. The field of teacher knowledge has

links to the research on teacher effectiveness and classroom behaviour such as that reviewed in Dunkin and Biddle (1974) and Brophy and Good (1986). In their 1974 classic *The Study of Teaching*, Dunkin and Biddle attempted to synthesize the research findings on teaching practice into a coherent description and explanation of how teaching works in schools. The research was of a positivistic bent and the information was definitely of the *knowledge about teaching* variety and owned by the researchers. This research is different than the approaches and outcomes of researching teacher knowledge.

Shulman's seminal paper in 1987 was based upon findings from case studies and focussed on the knowledge base of teachers. A generalized description of the knowledge base of teachers was developed that included *content knowledge, general pedagogical knowledge, curriculum knowledge, knowledge of learners and knowledge of educational ends*. The research approach was in the positivistic tradition in that the aim was that *teaching* was to be explained and generalization of this explanation to all teaching. There was a shift from previous research approaches from *knowledge about teachers* to *knowledge of teachers*. Schulman noted in this paper that:

> We find few descriptions or analyses of teachers that give careful attention not only to the management of students in classrooms, but also to the management of *ideas* within classroom discourse. (p. 1)

This marked a shift to considering the knowledge and meaning teachers hold as a significant aspect of education and schooling, and therefore teacher knowledge is a key element in reform initiatives in education and the education of teachers. The approach adopted was positivistic and a general model of the teacher knowledge base was an outcome. The focus of research moved from the objective collection of information about teaching by external (university) researchers to teachers as researchers or at least research collaborators. Teachers became viewed as the prime source of information about teaching, and teacher knowledge was recognized as valuable in understanding classrooms and teaching (Lytle & Cochran-Smith, 1992). Research approaches moved from the quantitative, positivistic to more narrative-based research that relied on teacher stories as a base of information about teacher knowledge (Carter, 1993). The results of these researches do not lead to the development of generalizations of sample-based findings to population descriptions and explanations that are fundamental to positivistic research, but rather to. . . *the framing of patterns with respect to certain themes. Generalizations from this latter form are not laws to which to which we have to conform to be effective but explanatory propositions with which we can make sense of the dilemmas and problematics of teaching* (Carter, 1993, p. 10).

The field of teacher knowledge research has furthered the focus on teacher knowledge and has evolved into research based on narratives and reflection as sources of information. This shift in research approach has been accompanied by a change in focus from *knowledge about teachers and teaching* to *teacher knowledge* (Fenstermacher, 1994). Many studies have made sharp descriptions and distinctions among different kinds of teacher knowledge. Fenstermacher (1994) distinguishes between formal knowledge which is knowledge about teaching, and practical knowledge which is personal knowledge held by teachers that relates to how to teach in a given context. Grimmett and MacKinnon (1992) describe two aspects of teacher knowledge, pedagogical content knowledge and pedagogical learner knowledge and then subsume these under the rubric of craft knowledge. Craft knowledge is considered the higher order category that distinguishes teacher knowledge as unique within the profession of teaching – knowledge that is not a stable, structured knowledge base (such as the knowledge base associated with fields such as pharmacy or a field of engineering for examples) but rather a dynamic, personal knowledge-in-action that is acquired through the experience of teaching. This conceptualization of teacher knowledge is similar to the personal practical knowledge of Clandinin and Connelly (1987) and the practical in-action knowledge of Schön (1991).

Wideen, Mayer-Smith and Moon (1996) describe *professional knowledge* as the knowledge (both the formal and practical as described by Fenstermacher) that teachers base their practice upon. This professional knowledge is therefore unique to the individual and to situation or context:

> (T)hese beliefs are not fixed or invariant among teachers because what counts as good teaching will vary among teachers and so too, therefore, will what counts as professional knowledge. (p.192)

Teacher knowledge as discussed by Wideen et al. is a general, global concept encompassing all knowledge, information and ideas that are brought to the act and practice of teaching, and in this particular study to the process of school reform. An emphasis of this and other teacher knowledge research is that this knowledge is complex, situationally specific and individually unique. Further, this knowledge is not formally acquired through instruction but rather through experience (Webb, 1995; Russell & Munby, 1991; Trumball, 1986). It is tacit, experiential, intuitive and situated knowledge as opposed to formal, explicit, analytic and structurally systematic knowledge (Hultmann & Horberg, 1995; Orton, 1994; Sutton, Cafarelli, Lund, Schurdell & Bischsel, 1996; Clandinin & Connelly, 1996).

In a cautionary discussion Buchmann (1987) questions the extent to which teacher knowledge is indeed *special knowledge* as opposed to more

commonplace subjective, commonsensical knowledge. She notes that the act of teaching is conducted by many individuals who have had no teacher education programming or induction. Further, she notes that most people have had prolonged exposure to teaching and have observed teaching first hand for a number of years. *It follows that teaching knowledge will not be considered special and that people will be ambivalent about its value* (p.152). Buchmann views the folkways of teaching, those . . . *patterns of action and interpretation that are existent, considered right and mostly uncodified* (p.154) to be the basis of teacher knowledge. She cautions that folkways are generally not scrutinized or evaluated systematically, since they have been developed through trial and error (experience); they are taken as given. This does not fit well within the context of empirical research.

Currently it appears that teacher knowledge is generally studied through narrative and reflective case study approaches in which teacher knowledge is investigated as a whole. This contrasts to earlier research approaches that were of a more positivistic character and more analytic in their decomposition of knowledge of teaching and teacher knowledge into constituent parts (variables). Many of the more recent studies are conducted within the context of reform of teacher education (Grimmett, 1998; Hargreaves & Jacka, 1995) or schools in general (Clandinin & Connelly, 1987; Wideen et al., 1996). As noted by Carter (1993), the situational specificity of cases and the multiple interpretations of stories can lead to problems in developing a corpus of research that will cogently inform teacher education or school reform. So, there is much work yet to be done in the area of teacher knowledge and the study introduced in the next section is one attempt to make a positive contribution to understanding teaching and learning.

The Study

This study isolated its focus on one task that is characteristic of teacher responsibilities and activities in the school: the evaluation of student achievement. It involved over one hundred pre-service elementary teachers who assessed the performance of three simulated students on a number of language arts tasks. Information collected included the marks assigned to students on various submitted assignments and test, and journal entries.

The study continues an investigation into the procedures and information bases pre-service teachers use in making judgements about student achievement (Wilson, 1996; Shulha, 1996). The initial studies attempted to investigate how teachers go about evaluating the achievement of their students. These studies were based upon a dataset developed by Wilson and Shulha of Queen's

University. They created a set of portfolios containing achievement products (such as written assignments and tests) and background information for a simulated student called *Chris* in a grade 8 language arts class. The contents of the portfolio were controlled in terms of achievement level of products and the background of the student. This resulted in three different simulated students. Each participating student teacher was given the work of one of the simulated students to evaluate. As part of an undergraduate teacher education course in classroom assessment, 147 student teachers graded the components of an assigned portfolio over a 12-week period and reported a final grade for *Chris* at the end of the term. These scores and grades were the basis for an investigation of the structure underlying the evaluation of achievement by these student teachers.

The current study utilized the teacher-knowledge perspective alongside a traditional empirically based research design. The portfolio structure was modified in that each portfolio contained the work of three different students, and each student teacher graded the same three students. The students were now assumed to be in grade 5. Although the language arts assignments and tests were essentially the same tasks as in the previous study, student responses were modified to better reflect the work of students of this age. Each student teacher was required to grade each assignment as if it was requested by their sponsor teacher. Accompanying each set of student responses were instructions from the sponsor teacher in regard to the grading (for example, some background to the student tasks and the total worth of each assignment). However, directions in regard to how to grade the student work were designed to be rather ambiguous. The student teachers were not provided with marking criteria, keys or rubrics. Student teachers were also required to maintain a journal in which they recorded the thoughts they had about the work they were doing with their portfolios. It was suggested that any comments, views, frustrations and accomplishment they encountered in marking the student work was to be noted and discussed in their journal.

The basic data layout consists of a single complex record for each participating pre-service teacher (Figure 1). Each record contains the same data elements but varied in terms of content and structure - particularly the journal entries

Journal Entries	Student 1 marks & grades
	Student 2 marks & grades
	Student 3 marks & grades

Figure 1. Data layout for each student teacher record

since there was wide variation in the nature and volume of the information written by participants. The analysis of this information will involve both statistical and interpretive approaches.

The marks and grades that each student teacher generated will be summarized and compared across the three simulated students. The goal is to investigate the extent to which the student teachers viewed their three students as distinct in terms of their achievement in language arts. The design of the portfolios was intended to create a low achieving student, one that was high and a mid-range achiever through the development and inclusion of student work that consistently represented what was viewed as low, mid and high ranges of achievement. The extent to which these results are reflected in the grades and marks assigned by the student teachers will be an index of the design representativeness of the portfolios.

The intercorrelations of marks and grades will be calculated to investigate the extent to which each assignment and test yields the same kind of information about the simulated student. Since the underlying factor in the student work is language arts achievement, it is anticipated that strong, positive correlations will emerge. Comparisons will be made to investigate difference in student teacher subgroups – gender, and course instructor. Factor analyses will also be conducted to investigate latent structures in these data.

The journal entries will be explored and analyzed to reveal any elements and patterns in the thoughts, concerns and issues that student teachers expressed as they were attempting to complete their task of grading their three students. The student teachers were all given the same materials on the students, the cooperating teacher and the school. Since this information was rather sparse, there are likely to be variant interpretations of the task and situation. Ambiguities of expectations and task definitions are likely to be issues that are expressed in the journals. As well, the rather limited information provided on each student has created a more decontextualized evaluation situation than what is likely to occur in most classrooms. It is expected that the extent to which this is noted as an issue in the journals may be a major element of the journal data. However, the analysis of the journal entries may provide a rich source of information about the concerns and thoughts related to the evaluation of student achievement.

The journal entries are linked to the marks and grades. Therefore the patterns in the journal data can inform the further analysis of the marks and grades. Categorizing meaningful patterns found within the journal data will allow for the use of both, information from the journal entries and assigned marks in statistically modeling the evaluation of student achievement. This will prove to be a complex task. The use of journal entries for the development of

categorical information will be fed into a structural equation model. This should allow for the development of a model that is based upon structures suggested by the thinking of the individuals generating the achievement data. The previous studies in this research embedded information about the simulated student into the portfolio materials. The model developed from these data (Anderson, 1996) was meaningful but accounted for a relatively small proportion of variance in the assessment data. It is anticipated that the results of this study should provide a model that will facilitate the study of the structures underlying the evaluation of student achievement.

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